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November 1952

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Lydia J. Roberts Essay Award

Nutrition Clinic for Garment Workers

36th A.D.A. Annual Meeting, Los Angeles, August 25–28, 1953

PUBLISHED BY *The American Dietetic Association*

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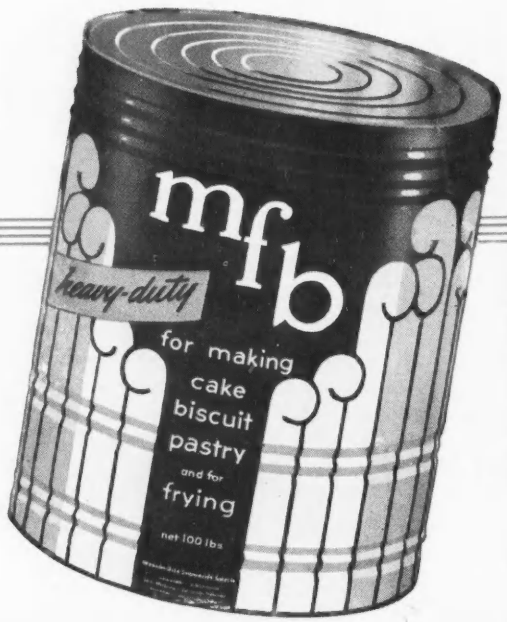

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NUMBER 11

Journal OF THE American Dietetic Association

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The Journal of the American Dietetic Association is published monthly by The American Dietetic Association, Mt. Royal & Guilford Aves., Baltimore 2, Md., and 620 N. Michigan Ave., Chicago 11, Ill. Neither the Association nor the Editor assumes responsibility for the opinions expressed by authors of papers abstracted, quoted, or published in full in this Journal.

Subscriptions: Rate $6 per year in advance in the U. S., Canada, and countries of the Postal Union; all other countries, $7 per year in advance. Special rate to undergraduate students and dietetic interns in approved internships, $2.00 per year in advance, if order is approved by head of the department. Single copies, 75 cents in advance. All correspondence concerning Journal subscriptions, orders for copies or reprints from the Journal, and notices of change of address should be sent to The American Dietetic Association, Mt. Royal & Guilford Aves., Baltimore 2, Md., or preferably 620 N. Michigan Ave., Chicago 11, Ill. Notices regarding change of address should reach the publisher by the *23rd of the month before the date of issue* on which the change is to take effect and both old and new addresses must be given. Claims for Journals lost in the mail will not be entertained more than six months after the date of the issue involved.

Editorial Correspondence: All articles and notices for publication, general correspondence, and inquiries should be sent to the Editor at The American Dietetic Association, 620 N. Michigan Ave., Chicago 11, Ill. Manuscripts are accepted for publication on condition that they are contributed solely to the Journal. Copy must be double-spaced and two copies, an original and one carbon, submitted.

Advertising: All correspondence concerning advertising should be addressed to The American Dietetic Association, 620 N. Michigan Ave., Chicago 11, Ill.

COPYRIGHT, 1952, BY THE AMERICAN DIETETIC ASSOCIATION Printed in U.S.A.

Entered as second-class matter June 30, 1925 at the Post Office at Baltimore, Md. under the act of August 24, 1912

Published monthly by The American Dietetic Association

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Some Current Aspects of Nutrition[1]

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THIS is a good time to take stock of the present status of nutrition and perhaps attempt to peer a bit into the future. It is now more than ten years since we entered into active participation in World War II. As in other fields, the hothouse of war has forced development in nutrition; perhaps it has also caused some inhibition. As we face now the threatening and precarious future, we are concerned with the unusual problems which may arise. For these reasons it is profitable to examine certain current aspects of nutrition.

Those phases which are more or less directly concerned with human beings, both sick and well, will be of the greatest interest to dietitians as well as more within the scope of my training and experience. I have, therefore, chosen to consider first certain aspects of nutrition related to clinical medicine and second, some concerned with public health, or the nutrition of populations, with particular reference to their setting in war and disaster.

Nutrition and Clinical Medicine

Since shortly before the war we have seen a gradual but steady loss of emphasis by physicians on nutritional deficiency diseases as such—not only in this country but abroad—if one excepts those areas which suffered significant restrictions in food consumption. This loss of emphasis has been, in part at least, caused by a lessened incidence or virtual disappearance of these diseases as such, resulting from a better economic status, certain governmental aids, better public education it is hoped, and perhaps a considerable amount of self-treatment. At present, those in this country interested in such diseases in fully developed form must seek them in other lands. It is possible, too, that unwarranted emphasis on possible latent or minimal disease states, undetectable by even relatively exact laboratory tests or by impairment of function, may have led to skepticism. That too complacent an attitude in this respect is not altogether warranted is suggested by the recent report of Follis, Park, and Jackson (1) of a rather surprising amount of scurvy in children under two as determined by post-mortem histologic examinations made in the years 1926 to 1942. Whether such a situation exists in older children is not clear, but the findings should serve as a warning. Whatever is the cause, clinical interest has become focused on some of the more acute nutritional problems, those related to such well known diseases or disease states as heart failure, edema, hypertension, renal failure, ascites, and those related to the use of antibiotics and parenteral feeding, as well as the longer-term problems of arteriosclerosis and aging.

OVERNUTRITION

Current clinical interest in nutrition centers less on the nutrimental deficiencies themselves than on certain immediate effects of nutritional disorders on other disease and on the use of nutrients and nutritional processes to affect and treat other disease, often without reference to the nutritional situation as such. Evidence of this is found in the growing attention to the effect of an excess of nutrients or overnutrition. An example is the ever-increasing interest in obesity. The interest is not confined, however, to a simple excess of calories. Specific nutrients are involved and sometimes even individual components or fractions of nutrients, such as the amino acids of protein or certain components of fat.

The latter is a particularly good example. The demonstrated occurrence of a certain type of fat molecule in the serum of patients with arteriosclerosis more often and in greater amounts than in supposedly sound persons (2) has led to the indictment of a number of fat- (or cholesterol-) rich foods. Such nutritionally important foods as eggs, milk, cream, and butter have been classed as harmful and their use restricted, if not prohibited. The effect

[1] The Mary Swartz Rose Memorial Lecture, given before the Greater New York Dietetic Association on March 3, 1952.

of such restriction is clearly apparent. While the resulting lessened caloric intake may be and often is desirable and beneficial, in many instances the restriction may make good nutrition more difficult to maintain in other respects. The actual effect of such restriction on the development or progression of arteriosclerosis remains to be demonstrated.

This recent development is also illustrative of another aspect of nutrition. Experimental arteriosclerosis is accomplished in animals only by increasing the intake of cholesterol or similar substances to very high levels and then, for the most part, only in herbivorous animals not consuming such substances in any but small amounts under natural conditions (3). In dogs, added thiouracil or a similar thyroid-inhibiting drug is needed (4).

COMPLICATIONS RESULTING FROM DIET THERAPY

A second group of nutritive substances currently subject to careful clinical scrutiny and study, with the knowledge so gained being widely applied, is that of certain minerals. Here is an example of clinical interest in nutrients in relation to disease states to which they are not primarily related in the sense of dietary deficiency or excess. Their manipulation is undertaken on a therapeutic basis. Certain disturbances in the nutrition of these substances result as a by-product or complication of such manipulation. Such abnormalities are similar to those occurring in diseases such as peptic ulcer where therapeutic dietary restrictions may cause nutritional deficiency. The process in the case of certain minerals or electrolytes is much more specific, however. It is worth noting, furthermore, that in many instances these mineral deficiencies are acute, and immediate replacement or relief of the deficiency is needed.

Sodium Restriction

The outstanding example in this field is sodium. The popularity of low-sodium diets in the treatment of a variety of conditions, such as hypertension, congestive heart failure and the accompanying ascites and edema, and ascites from hepatic disease, indicates to some degree the actual success of such measures although overenthusiasm has been evident. There are, however, both drawbacks and complications to sodium restriction. As in any measure of this sort, the danger of an actual deficiency of the nutrient—in this case sodium—exists, and not only limits the use of the procedure but may result in disaster for the unwary. Recently, attention has been called to the occurrence of sodium deficiency in individuals on low-sodium diets. Not infrequently this acute deficiency is exaggerated or precipitated by other procedures, some of which are of at least quasi-nutritional nature, such as the excessive intake of fluids and the parenteral administration of glucose. Other procedures are pharmacologic, such as the use of mercurial diuretics. The deficiency of sodium may result in a depression of the output of urine, other changes in renal function, disturbances in electrolyte balance, azotemia, acidosis, and in some cases renal shutdown and death.

Another procedure causing sodium deficiency is the growing use of so-called exchange resins, substances which remove sodium (and other electrolytes) from the body and are used as supplements to other treatment for ascites, edema, and other conditions requiring low-sodium intakes. Despite a relatively low affinity for sodium, the ten-times-greater concentration of sodium in the body than all other cations combined makes the removal of sodium relatively great. This removal, while not especially serious in patients with normal intakes of sodium, may, when added to a low intake, bring about a sodium deficiency as described above. Actually, the best use of the resins is to permit the intake of sufficient sodium to flavor the food and make the low-sodium diet acceptable, rather than to use it primarily to reduce the sodium content of the body.

These resins may also bring about deficiencies of other minerals. If less sodium is available, as in a low-sodium diet, potassium removal may also be so great as to cause hypokalemia. Five times as much potassium as sodium may be removed. For this reason, newer, high-capacity resins now contain a portion in the potassium cycle, the potassium being released in the upper gastrointestinal tract. Nevertheless, actual potassium deficiency may occur even with these newer, special resins and a supplement of potassium may be necessary.

The high affinity of these resins for divalent ions may result in a loss of calcium over a prolonged period. Calcium levels in the blood do not ordinarily change, but demineralization of bone may occur. The acidosis accompanying the administration of exchange resins aids in preventing tetany, but if the acidosis is lessened, as by an increased chloride excretion with mercurial diuretics, tetany may occur. Magnesium, iron, and some vitamins also may be removed by cation-exchange resins. For this reason, it may be advisable, when they are employed over any but short periods, to give 5 gm. calcium lactate or 1 pt. milk daily as well as supplementary vitamins. These should not be given at the same time as the exchange resins. Under some circumstances, a mild hypochromic anemia, perhaps the result of iron deficiency, may develop.

It is interesting that the possibility of causing such sodium deficiency by the use of resins should not have received more attention. The symptoms of sodium deficiency have long been known and could have been anticipated as the result of prolonged intake of a low-sodium diet alone. From a nutritional viewpoint, we have the situation of a syndrome ordinarily developing as an idiopathic, primarily dietary deficiency of a relatively chronic nature, induced in an acute and severe form as part of a therapeutic procedure.

Potassium

Another mineral which has been receiving attention recently is potassium. It is of particular interest to the nutritionist and dietitian because in relation to it we find an excellent example of that always-intriguing happening: the discovery of a modern explanation of an old-time empiric procedure.

Deficiencies of potassium occur in both acute and chronic forms. The acute type is found ordinarily under conditions in which increased loss occurs in the urine and stools at the same time that intake is restricted. Such conditions are found in trauma, after operations, with drainage of body fluids, and with gastrointestinal suction, vomiting, and acute diarrhea. Food intake is often small under these circumstances, and fluid and mineral replacements are usually by potassium-free saline (sodium chloride) and glucose solutions. The use of cortisone and ACTH may induce a similar deficiency, especially if food intake is restricted. Diabetic acidosis causes initially an increased transfer of potassium from the cells to the serum with a rise in the latter. However, with recovery from the acidosis, there may be a precipitous fall in the serum potassium concentration to a level sufficient to cause symptoms. The use of insulin and glucose may contribute further to these changes. Finally, mercurial diuretics with low-sodium intakes may precipitate not only sodium deficiency but also an acute potassium deficiency.

A form of potassium deficiency of greater interest from the usual nutritional viewpoint is the milder form associated with chronic illness, particularly with illness accompanied by diarrhea and associated with lessened food intake. The lassitude and weakness associated with chronic illness and with convalescence from some illnesses are undoubtedly due to potassium deficiency. The interesting situation regarding the finding of scientific explanations for traditional empiric treatments to which I referred earlier is the fact that beef broth and meat extracts, so frequently used in the past in convalescence, are rich in potassium.

Before leaving potassium it should be noted that potassium excess with accompanying toxicity is also encountered, especially in renal failure, and that the symptoms and signs are indistinguishable from those of potassium deficiency. This danger, in relation to the administration of potassium for supposed potassium deficiency, is obvious, since either deficiency or excess may be fatal. Determination of the level of serum potassium is most helpful in this situation.

PARENTERAL FEEDING

A third large area of clinical interest in nutrition recently is that of parenteral feeding. The importance of parenteral feeding lies in the need to restore or maintain adequate nutrition under conditions which preclude food intake and utilization by mouth. Adequate nutrition in this regard refers principally to calories and protein and the continuation of the feeding over relatively long periods. Vitamins and minerals are relatively easily supplied in this manner, and parenteral nutrition for short periods, really a replacement procedure, offers no great difficulty.

Though it can be accomplished fairly satisfactorily, certain common errors in the application of longer continued parenteral feeding often make it less effective than it should be. At present, the greatest practical interest centers about the supply of protein, most effectively accomplished by the intravenous injection of solutions of amino acids. One of the principal errors is failure to provide enough calories to protect the amino acids from utilization as energy rather than for the synthesis of protein. Energy requirements have first call. If they are not satisfied, amino acids will be burned for fuel rather than formed into protein. For the utilization of amino acids, there must, therefore, be available a supply of other calorigenic material which must be readily available at the time the amino acids are injected.

Studies on animals and on obese subjects would lead to the conclusion that few or no exogenous "calories" are needed to protect the injected amino acids, the caloric deficit being supplied by body fat. While this may be true under some experimental conditions and in obese subjects, the ordinary patient requiring parenteral amino acids will need a ready and adequate concomitant supply of energy, if the injected amino acids are to be used effectively and economically in the building of proteins to replace and preserve tissue and reserve protein (5). This in turn introduces another problem—that of a possible source of such calories. This is a difficult problem.

Glucose is, at present, the substance commonly used, but it has many drawbacks. Too concentrated a solution is irritating and causes thrombosis while

too rapid administration leads to loss through the kidneys. More dilute solutions involve the intake of large amounts of water which is undesirable or may even be dangerous, inducing congestive failure often of even serious degree. There is also the added danger of electrolyte disturbances already described, induced or precipitated by fluid as well as the glucose.

Fat administered intravenously would solve the problem reasonably well if it could be given without untoward reactions. Fat can be administered in the form of emulsions, and the matters of absorption, utilization, lack of wastage or loss from the body, and local irritation, are not problems. To date, however, satisfactory emulsions have not been devised for ordinary clinical use. The outstanding fault is the presence of pyrogens which cause febrile reactions, although they do not always occur and are not always serious. The preparation of a consistently pyrogen-free emulsion has not been achieved, and the reactions, while usually mild, are unpredictably severe at times. A further problem is the preparation of emulsions which are sufficiently stable to permit storage and distribution for general clinical use.

ANTIBIOTICS

A fourth current and relatively new problem in nutrition is that of the effect on nutrition of the administration of antibiotics. This field has been studied far more in relation to animal nutrition than to human medicine. In man, the role of intestinal bacteria in the production of required vitamins and the questions of absorption and/or utilization have not been determined. Nevertheless, the possibility exists that the administration of antibiotics, by suppressing bacterial growth and action in the intestine, may induce deficiencies. Unfortunately, the lesions most often found in association with the use of antibiotics are various types of dermatitis, glossitis, and stomatitis (6). They are also related to another complication of antibiotic therapy, the establishment and overgrowth of certain molds and yeasts (Monilia), not commonly present in the affected sites (7). This overgrowth of itself may be the cause of the dermal and mucosal lesions. Such an occurrence, recently reported, was that of perianal pruritus and proctitis caused by Monilia in a patient receiving antibiotics (8). Curiously, implantation and overgrowth of Monilia in the intestine may actually lead to the diversion of administered thiamine and its loss to the body (9).

NUTRITION IN RELATION TO AGING

A fifth area of current clinical interest which is assuming greater importance is the relation of nutrition to senility and the aging process. This is quite aside from the specific problems of nutrition in diseases characteristic of old age, such as kidney and heart disease.

Speculation, and it can be little more at present, starts with the well-known findings of McCay and others that in rats a limitation of caloric intake during growth leads to a significant increase in the life span. The finding is significant in several ways, even though it is by no means clear how much if any of it can be applied to man. It must, however, lead to a consideration of the advisability of "forcing" the nutrition of children. There has long been before us the possibility, if nothing more, of a deleterious effect of disproportionately good nutrition or intake of some nutrient on the nutritional status of the others, i.e., the production of a deficiency of one nutrient because of the excess intake of another. The study of scurvy referred to earlier is perhaps an example of such a situation.

Historically, and to some extent in the present, we have another excellent example. The improved economic status and greater caloric intake of populations in the nineteenth century resulted not only in more rapid growth of children but in greatly increased and unsatisfied requirements for vitamin D, thus causing widespread rickets.

The physiologic disturbances and increased vulnerability of children during rapid growth are well known clinically, even though difficult to demonstrate on a clear-cut, objective basis. Such periods, though initiated and produced by endocrine function, depend at least in part on the supply of nutrients. Whether simple abundance of calories, permitting greater and more rapid growth, may cause changes to be reflected in earlier senescence, is unknown. However, in view of the changing incidence of certain degenerative diseases, the possibility must be kept in mind. Certain findings in relation to the nutrition of populations that may have a bearing on this problem will be discussed below. A minor sidelight on this improved feeding and dietary is the additional number of cases of vitamin A poisoning being reported (10).

An interesting aspect of nutritional change in old age is the shift in body composition. By and large, leanness has been considered a natural and desirable physiologic attribute of aging. Nevertheless, many older people develop more or less obesity with all the well-known consequent disadvantages. Furthermore, and of possibly even greater significance from the viewpoint of fundamental processes of nutrition in the aging, Brožek and Keys (11) have shown that

despite the maintenance of body weight at a constant, "normal" level, the proportion of fat to total tissue increases with age until in older men it may amount to as much as 22 per cent compared to approximately 10 per cent in younger men.

Such a shift in body composition may be reflected in the lower basal metabolic rate characteristic of the aged, as well as a possible shift in ratio between catabolic corticosteroids and anabolic androgens and estrogens, as suggested by Albright (12). The muscular atrophy of old age is well known. The action of androgens (testosterone) in producing a positive nitrogen balance, gain in weight, and possibly an increase in muscle tissue is in line with these concepts.

Other aspects of nutrition in the aged, including possible disturbances in intestinal absorption, changes in intestinal flora, and modifications in the metabolism of certain essential amino acids, are additional interesting avenues for further research.

Nutrition of Populations

The second large aspect of nutrition about which I wish to comment is public health nutrition, or the nutrition of populations. Our interest in this is sharpened by the threatening state of the world and the possibility of disaster and its effect on the nutrition of peoples.

Sufficient time has now elapsed since World War II to enable us to draw at least some conclusions and make some evaluations of our nutritional experience. Except for certain specialized problems dealing with the unavailability of food supplies because of radioactive contamination, microbic action or destruction, which are of concern to us now only as they diminish supply, the problems we will face are largely those which would follow a possible food shortage.

One of the principal items of concern in such a situation is and always has been the effect of long-time restriction of food on children. Studies in Europe, some of them carried on for periods of years, indicate that unless the undernutrition is very severe, perhaps involving nutrients other than calories, recovery is complete. For instance, Bransby (13) found in England that British school children showed no delay in reaching standard heights and weights between 1940 and 1943, although Milligan and Lewis-Faning (14) had found a slight delay in reaching heights, a deficiency subsequently corrected. Delay in growth rate did not occur in Holland until late in the war.

In some measure, such findings may be due to the effect of better distribution of available supplies, despite the reduced food *supplies*, as in Switzerland, and, to some extent, in England. Actually, delay does occur if the decreased supply results in reduced consumption of a sufficient degree. The important part is, however, that such delay is for the most part entirely reversible. This is well shown by the finding in France of Trémolières and Boulenger (15). These authors found the maximum delay in thirteen-year-old girls, but by the time these girls were sixteen, the deficit had disappeared. It is of great interest and importance that the average heights of all age groups of these French children were greater in 1948, some two years after the war, than before the war.

What the effect of such an experience might have on the process of aging and life span in view of the findings of McCay, already referred to, is unknown, but is an interesting speculation. Follow-up studies on these subjects with this in mind would be most interesting.

Reference has already been made to the thirteen-year-old girls as being the most severely affected of the French children. This calls attention to the variability of age groups in relation to susceptibility to nutritional damage. To some extent this factor of age in turn varies with the different nutrients. There is also a sex variation operating within this pattern. Such relationships have, however, not been clearly defined. In western countries, at least, the most susceptible groups seem to be preschool children and those in the eleven- to thirteen-year brackets. Another particularly susceptible group is the aged. It is clear that other than strictly nutritional factors are involved in these findings, as observed in studies of populations.

Among the populations of working age, occupation is a dominant factor in determining not only nutritional effects of food restriction but all the socio-economic and governmental administrative measures which are involved. A number of studies of nutrition in relation to work output and other aspects of industry in Germany, made during the war and especially after the war, have provided much useful information regarding this important phase of nutrition in respect to a shortage of food. It is worth noting that, in general, the social and psychologic factors concerned are more difficult to evaluate and control than are the physiologic.

Recovery from Deficiencies

Recovery from nutritional deficiency is an important problem and one about which considerable information has been gained in recent years. Reference has already been made to the complete recovery

by children from the growth lags. Such recovery presupposes the absence of damage great enough to leave irremediable defects or scars. In the case of the children referred to earlier, the observed effects were probably related to caloric deficiency. The same conclusion can probably be applied to adults, whose recovery can be virtually complete unless permanent damage, principally of a structural nature, has occurred. Among the latter can be included such things as atrophy of muscles following neuritis and loss of teeth. Here again such defects are more often related to such nutrients as the vitamins than to caloric or protein deficits. There is, however, a lag in recovery in adults corresponding to that in children, even though not manifest in growth, its direction and severity depending on the degree of malnutrition. Those residues and disturbances have been well described by Keys *et al.* (16).

Briefly, recovery is marked by a tendency to become overweight, with the deposition of a disproportionate amount of excess fat. Fatigability, minor vasomotor abnormalities, and some emotional disturbances are commonly observed. The persistence of these changes is, of course, variable and not of long duration in mild to moderate deficiency, primarily caloric, such as was seen in western Europe after the last war. In the more severe deficiencies, such as were observed among Allied prisoners-of-war held by the Japanese, much more severe and persistent residues are found, with fatigability, sweating, paresthesias, optic atrophy, deafness, edema, circulatory complaints, digestive disturbances, and nervousness being the most common. Some, such as the optic atrophy, are of course permanent defects. It should be noted that in these severe deficiencies, factors other than calories are involved.

BODY'S POWER OF ADAPTATION

The recent experience during and following the war has served to emphasize and to clarify the body's rather remarkable powers of adaptation to undernutrition. One mechanism has already been described, that of temporarily lessened or delayed growth in children. For adults there are adaptive processes also. There is loss of weight, also occurring in children if the lack of food is sufficiently great. Weight loss alone is sufficient to reduce very materially the caloric requirements simply because of the reduction in bulk. An additional reduction in requirements is obtained from a lowered metabolic rate. A decrease in the caloric expenditure for physical exertion provides further savings, 40 per cent of which is in the direct energy cost, in direct proportion to loss of body weight. These reductions in metabolism and energy cost of exertion in turn lower the requirements of other nutrients, notably the B-complex vitamins.

Within a given range, say 10 to 15 per cent of calculated ideal body weight, losses of weight are compatible with, even conducive to satisfactory work output as far as physical ability is concerned. The decrease in cardiovascular-renal disease, diabetes, and the like, in populations under these conditions is significant in this respect. When, however, greater losses occur, the adaptive mechanism of voluntary curtailment of activity operates to reduce work output. Voluntary maintenance of work output under these conditions result in further reduction in weight and efficiency which are soon reflected in involuntarily diminished output.

Work output is affected not only by the state of nutrition but also by the time devoted to obtaining food, especially food supplemental to official rations. A population may remain reasonably well nourished but at a reduced level, yet little productive work will be done, if most of its physical efforts are devoted to obtaining supplemental food. Also, supplemental feedings for workers, for the purpose of maintaining increased production, are likely to be diverted to families unless the ration also provides for the latter.

NUTRITIONAL SURVEYS

To secure most efficient utilization in times of food shortage, it is necessary to control distribution, which in turn requires determination of nutritional status. This leads to a consideration of nutritional surveys. Much was learned about the technique of surveys and the interpretation of the data so obtained, during and after the war. Measurement of body weight on selected samples, with additional measurements of height for children, constitutes the best single criterion of nutritional status of populations at mild to moderate levels of food restrictions.

This sounds simple and easy to do, but in practice the procedure presents a number of difficulties. To begin with, there is no suitable standard of height and weight. Such standards are badly needed, not only for this population but for those of other countries, and this is the most serious gap in our techniques. The procedure of sampling has not been established on a sound basis. The technique of weighing remains faulty (in practice). Measurement of skin and subcutaneous tissue thickness, in addition to weight, may prove helpful. Physical signs and symptoms are valuable only insofar as they are (a) clear-cut and characteristic, and (b) present, though doubtful, in numbers greater than normally occur in a population. At best they are a late manifesta-

tion and portend immediate serious and widespread disability. Laboratory findings may be of great predictive value. For example, the findings of plasma ascorbic acid in even small amounts may be taken to indicate the unlikelihood of general scurvy for some months, for even with no intake of ascorbic acid, such a period is required to deplete the body reserves to the scurvy level.

Other factors, more psychologic than physiologic, are effective and important in determining the nutritional status of populations under stress and their behavior in respect to the control of food supplies. For example, people will voluntarily restrict their food intake because of dislike for a nutritious food to a degree which will cause mild but significant deficiency in some nutrient. This is particularly true if the food is unfamiliar, not a part of the customary or traditional dietary. This is even more true if the food is of an artificial rather than a natural origin.

Populations customarily subsisting on mixed and varied dietaries will suffer less from enforced restriction of quantity than those on a dietary of limited variety.

Reduction in nutritional state, notably in calories, is accompanied by significant emotional changes.

Reduced food supplies are apt to affect the older segment of the population the most. Infants are found to be relatively little harmed, but children eleven to fifteen and three to five are apt to be more severely affected.

SUMMARY

I have attempted to point out some of the current interests in nutrition and some of the findings of studies conducted during the past war as they may give us some help in the event of future disasters. The trend of interest toward emphasis on disturbances of nutrition related to newer methods of treatment of individual patients with other disease has been pointed out, together with some of the problems in nutrition in public health. Such considerations indicate more clearly than ever the increasing responsibility of all those trained in nutrition in respect to both the medical care of individuals and the control of the nutrition of populations under trying conditions.

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Did You Know that the School Lunch Program:

. . . Has utilized approximately 76 million loaves of bread in the past year?

. . . Has received more than 3¼ billion pounds of federally donated commodities since 1936, enough to make up 820 trainloads of 100 cars each?

. . . Has received annually about $70 million in support from state and local governments and communities?

. . . Has produced meals costing $2½ million for each day of operation?

. . . Has used more than 14 million dozen eggs which have been distributed free in dried form since 1948?—*O. F. Beyer, Area Field Supervisor, Food and Distribution Branch, Production and Marketing Administration, U.S.D.A., Chicago.*

Phosphorus Compounds in Nutrition and in Industry[1]

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TODAY there are a host of phosphorus compounds (inorganic) that find a useful place in many food mixes, food processing operations, and the rations of domestic animals.

Recently there appeared in *Consumers' Research Bulletin* an article titled "Phosphates and Phosphoric Acid: Undesirable Food Ingredients" (1) which pointed to many assumed detrimental effects of phosphoric acid and phosphates. This article appears to have been written by someone unfamiliar with the many useful applications of phosphates in food, feed, and industry. Quotations are made from articles that point out the importance and harm of (a) an unfavorable calcium-phosphorus ratio, (b) the possibility of anemia from the formation of iron phosphate, making the iron unavailable, (c) an excessive ingestion of phosphorus, causing renal lesions, and (d) high phosphorus ingestion causing a decreased amount of phosphorus in the muscle. Finally, it contained an appeal to the federal government to prohibit the use of phosphoric acid in soft drinks and by the same token, probably, to curtail the citrus fruit industry because of the possible erosion of the teeth of those who drink these acid beverages.

The quotations from the literature in this article were, as one might expect, drawn from descriptions of experiments of laboratory origin. That is to say, they illustrate what may occur under certain extremely rigid conditions, but which are unlikely to occur in ordinary practice. For example, the unfavorable effect of an abnormal calcium-phosphorus ratio in feeds or foods is one not often experienced in practice. Livestock farmers consult their Agricultural Experiment Stations and avoid such possible difficulties.

ACID BEVERAGES

While the experimental work of McCay and Will (2) on the erosion of teeth (rats' and humans') by acid drinks similar in strength to cola beverages is definitely positive, it is always a question as to how far such results can be applied to the human population. A change to a lower phosphoric acid content in these soft drinks would no doubt be worth exploring. However, fruit juices, with the possible exception of lemon juice, are less corrosive and their use, which is probably more limited than that of cola drinks, should raise no serious problem.

McCay and Will state that teeth are usually considered subject to erosion if the *p*H of the mouth saliva is lower than 3.5. They found that cola beverages contain about 0.055 per cent phosphoric acid with a *p*H of 2.6. They considered the buffering effect of the saliva and found the *p*H values to range from 2.8 to 5.6, when a sucrose-phosphoric acid (0.055 per cent) solution was held in the mouth for ½ min. Among a group of thirty-two naval officers, half of whom were men and half women, the mean *p*H value of the saliva-phosphoric acid mixture of the men was 4.2 and for the women 3.7. These figures are above the 3.5 set as the *p*H at which definite erosion will take place.

All in all, it seems that the buffering effect of human saliva, together with the mucous film on the teeth and of the mouth, can act in many, if not most cases, as a protective agent for the teeth against acid beverages such as we are discussing here.

PHOSPHATES IN ANIMAL FEEDS

The common phosphorus-bearing salts used to reinforce animal feeds are usually bone meal or defluorinated phosphate. In these compounds, the calcium is in excess of the phosphorus, and such a relation is optimal for an animal. In Africa, ammonium phosphate added to water, because of its solubility, is commonly fed where phosphorus deficiency in cattle occurs. Actually, the cattle industries of these areas have been saved by the use of this salt. In limited areas in Texas and other regions in the United States where phosphorus deficiencies occur, it is common practice to supply animals with extra phosphorus through the use of sodium phosphate. *Only good results flow from this practice in the great cattle and sheep industries.*

[1] Received for publication July 9, 1952.

In the baby chick industry, many feed manufacturers add an extra supply of inorganic phosphate, such as bone meal or defluorinated rock phosphate, to feeds developed primarily for use during the first three weeks of the bird's life; in practice, it is continued beyond that time. This is because the type of phosphorus found in the plant material, which constitutes a considerable part of the ration, is less available than that of the inorganic compound. It is a question of relative availability of phytic acid phosphorus (the plant type) as compared with calcium phosphate. This is general practice and distinctly favorable for the early rapid growth. *In no way is it harmful.*

Practically all feeds for cattle, sheep, swine, and chicks mixed by reputable feed manufacturers are today reinforced with some inorganic phosphate. The cattle feed industry is a large one, and bone meal (calcium phosphate) or defluorinated rock phosphate (calcium phosphate) is one of the main inorganic supplemental materials for livestock feeds. It is impossible to point to a single recorded instance where harm has resulted to livestock from the inclusion of extra phosphate of the above types in the ration of farm animals. Excessive amounts of bone meal in the ration of poultry have at times been incriminated as the cause of slipped tendon, but these charges have been dropped as it was gradually learned that deficiencies of manganese and choline were the main culprits.

PHOSPHATES IN DAIRY PRODUCTION

During the first World War the manufacturers of evaporated milk were under a cloud, because much of their product coagulated to a heavy gel during sterilization. The soldier using it in his coffee thought it to be sour and threw the can away. Inability to sterilize the milk, yet prevent gel formation was a real problem. After much work at the University of Wisconsin (3), it was learned that coagulation was related to the balance of calcium and magnesium to phosphate and citrate in the milk. Summer milk usually could be processed without coagulation, because of its greater abundance in citrate, but not winter milk with its lower citrate content and relatively high calcium content. It was found that if a definite amount of disodium phosphate were added to the milk, it could be processed at will, resulting in a smooth, sirup-like material. Four to 10 oz. disodium phosphate per 1000 lb. milk would do the trick. Today, practically all evaporated milk is stabilized to the heating process by the use of this salt and coagulation is prevented. The addition of 4 to 6 oz. disodium phosphate per 1000 lb. milk represents an increase of 0.0087 per cent in the phosphorus content of the evaporated milk. *Phosphates saved another useful industry.*

Process cheese is made possible through the use of phosphates and the salts of certain organic acids. In this process the cheese is melted and then an emulsifying agent is added to hold the fat in the semi-solid mass. One to 3 per cent disodium phosphate is an effective emulsifying agent, allowing the semi-fluid cheese mass to be poured into molds to harden with little or no rind. The process also allows the blending of the flavor of cheeses of different ages and makes. About 60 per cent of the Cheddar cheese produced in this country goes into process cheese.

During the last thirty years the per capita consumption of cheese has more than doubled. Part of this increased consumption is due to the processing which gives more uniformity to the product—a consumer's preference. No rind is formed, and consequently loss in slicing is cut to a minimum. *Phosphates made another important process available.*

IRON PHOSPHATES AND ANEMIA

Twenty years ago studies (4) were carried out on the availability of iron for correcting an anemia produced by the exclusive use of milk as the diet of laboratory animals. Among the many salts tried were such compounds as ferric pyrophosphate and ferric hypophosphite. They yielded their iron for hemoglobin-building quite as readily as did the more water-soluble forms, such as ferric chloride or ferrous sulphate. Today sodium-iron pyrophosphate is used for the iron enrichment of flour, as is also ferric pyrophosphate for the enrichment of rice. These less water-soluble salts have the advantage in foods of lessening the dangers of rancidity, and at the same time contribute available iron through solution in the gastrointestinal tract. *The bare statement made by the author of "Phosphates and Phosphoric Acid: Undesirable Food Ingredients" (1) that phosphates in foods render the iron unavailable and thus cause anemia is contrary to experimental experience as well as established practice in food enrichment.*

PHOSPHATES AND BAKING POWDERS

In order to make flour available as food, it must be cooked in a proper manner. The simplest way is to mix it with water and bake it. This is ship's biscuit, a leaden, heavy mass. By allowing a gas, carbon dioxide, to develop in the mass, the particles are slowly pushed apart; the resulting product is light and spongy bread. To produce the gas, yeast or baking powder is used. All baking powders contain two ingredients, a carbonate and a compound which serves to liberate the carbon dioxide gas. The carbonate is usually sodium bicarbonate (baking soda). Among the compounds used to liberate the carbon dioxide from the baking soda is calcium acid phosphate, which reacts with the sodium bicarbonate. The residue left in the bread is sodium calcium phosphate. This is a perfectly harmless compound, and *there is not a particle of evidence that it is in any way detrimental.*

PHOSPHORUS IN MUSCLE

Phosphates play a fundamental and most important role in muscle. The writer of the article referred to in the early part of this paper implied that the ingestion of phosphate decreased the phosphorus content of muscle and thereby was harmful. As a matter of fact, the phenomena of muscle contraction are related to carbohydrate metabolism, which does not proceed in the absence of phosphates. First, the main source of energy is carbohydrate. To be metabolized, it must be united to a phosphate, and the process of liberating energy for muscle contraction involves the direct use of phosphates.

When these facts were first learned, about the time of the first World War, a certain group of soldiers was given an extra amount of phosphate in the diet. The idea behind this practice was that the extra phosphate would enhance muscular strength and endurance. Since the soldiers' diets already contained an abundance of phosphorus, no special benefit was observed, but it should be recorded that *no harm whatsoever followed the experiment.*

PHOSPHATES IN METABOLISM

The important role that phosphates play in intermediate metabolism in plants and animals is one of the striking developments in modern biochemistry. Some vitamins, to be active, are coupled to phosphate. Thiamine is an example, riboflavin another. Niacin, the vitamin active in pellagra prevention, is an integral part of two different coenzymes—coenzyme I and coenzyme II. The first consists of niacin, ribose, two molecules of *phosphoric* acid, and a molecule of adenine, and is known as DPN (diphosphopyridine nucleotide). Coenzyme II differs from coenzyme I in that it has three molecules of *phosphoric* acid and is known as TPN (triphosphopyridine nucleotide). Another vitamin, pyridoxine, in its active state is phosphorylated.

It is indeed significant that so many of the water-soluble vitamins must be phosphorylated to be active. Carbohydrates to be metabolized are first united to a phosphate; fats to be absorbed through the intestinal wall are initially linked to a phosphate; even the energy to be supplied for many of these metabolic operations comes from what is now known as "the high energy phosphate bond." It should also be noted that in centers where nutrition studies are carried out, hundreds of laboratory animals have been successfully reared with the dietary phosphorus wholly of inorganic origin. The statement refers to diets where phosphorus-free proteins or free amino acids have been used as sources of nitrogen.

What chemical unit plays a more important role in living things than phosphorus?

PHOSPHATES IN MISCELLANEOUS PRODUCTS

From what has been said concerning the many useful functions of phosphates in the animal and the utter harmlessness of controlled additions, it remains to be proved that the addition of phosphates to gelatin, rice puddings, pie fillings, self-rising flours, ready-to-bake mixtures, and so on is in any way harmful. No experimental data are quoted by the writer of "Phosphates and Phosphoric Acid: Undesirable Food Ingredients" (1) to substantiate his claim.

It is to be emphasized that all such products, whether specifically described or not, must by law be adequately evaluated for safety in the human dietary. Any manufacturer or processor who should be foolish enough to disregard this guiding principle of our pure food and drug regulations is legally responsible for his neglect and fully subject to prosecution. The foregoing pertains to general provisions of the law. In addition, specific standards exist for baking powders and for self-rising flours—two of the products cited as probably deleterious by virtue of their phosphate content.

This brings us back to the problem of other modifications of the diet which affect nutrition.

It is said that the calcium-phosphorus ratio of the diet is of the utmost importance. If one should consider the well established, though as yet not too well understood role of vitamin D in overcoming very wide variations in this ratio (far beyond the range of the practical diet), together with the abundance of this vitamin in our modern diversified diets and with sunlight as an extra source, the whole question becomes reduced to mere academic interest.

Furthermore, if the question be asked, "To what extent will the supplement of sodium phosphate involved in the various miscellaneous food products under consideration actually influence the over-all calcium-phosphorus ratio of the modern diet?" the issue becomes ridiculous. The effect—excluding the most peculiar of dietary habits—could hardly be detected, if indeed it would be possible to detect it at all.

Since we know of no published experimental evidence of a harmful effect of phosphate in such products as gelatin, rice puddings, pie fillings, self-rising flours, and so on, we must relegate the accusation to the Greek Calends and let it go as unproved.

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Professional Teamwork

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THE word "team" holds fascination. Being on a team produces a feeling of physical fitness, importance, integrity, and belonging. A team member in any situation, whether it be in athletics, public health, or medicine, must be an alert, skilled, responsible person who knows how to lead or follow as the situation demands. The team has rules, regulations, and a code of ethics. The team knows success and defeat, and through common experiences, the members have learned how to direct their skill towards achievement of the goal. Teamwork applied to the medical care of patients connotes and involves these concepts.

We are concerned with teamwork as a product of specialization in medicine. When medical practice becomes specialized and is carried on away from the natural environment of patients, the doctor must depend on others to cover features of the professional care which, in a simpler and more direct method of medical treatment, he has handled. With this change, specialized professions related to medicine have developed. The teamwork process gives recognition of the status of these allied professions and capitalizes on the results that come through cooperative effort.

Through teamwork, the work of the medical and allied professions is coordinated to the benefit of the patient. The professional group usually includes: the doctor as the captain, the nurse, the social worker, the dietitian, the physical therapist, and the occupational therapist. Of these workers, the social worker has had the greatest experience in the application of the teamwork method, although small units of these professional people have been associated in patient care for many years. One hears a workman say with confidence on discharge, "I will be able to carry on if I take my medicine and follow a good diet."

Numerous illustrations might prove the value and importance of the affiliation of the various groups in the therapy of the patient. A patient with a gastric ulcer, on discharge from the hospital, returned to his former occupation of fireman. He lived on a fourth floor and ate his meals at any convenient restaurant. Soon he returned to the hospital. After further study was made, he was released with dietary instruction and a warning. But, in addition, the social service department located for him a ground floor room, a place where a simple modified diet was available, and a sedentary, less stimulating type of work. This reduced the repetition of hospitalization.

SOCIAL WORKER'S ROLE

The medical social worker has had to maneuver in and through the complications of hospital procedures and has been an integrating factor in bringing professions together in relation to specific problems. Social service cuts across the entire hospital organization, and as the area of operation is not limited, the social worker traditionally has been given relative freedom in developing her field of activity.

She is in a strategic position to assist in the development and functioning of teamwork processes. In case work, she has recognized and appreciated the contribution which other groups might offer in specific situations. She has even somewhat aggressively approached the other professions and requested them to clarify and define their part in the medical plan for individual patients. In turn, she has interpreted her role and contribution. Her experience can be of assistance in developing and refining the teamwork method, and she is in a position to enrich the endeavor of the team by encouraging those groups who are inclined to view their own contribution from an isolated point of view.

In a teamwork situation, the content of each member's contribution lies in the medical plan for the total care of the patient and not in any one or more isolated segments of that plan. The relationship is a continuous one with an intimate sharing of experience and developments. The result of the combined efforts of all concerned is more fluid and flexible. The team may even extend itself into the community and initiate a counterpart arrangement to work on the care of a patient who has returned to his home environment. Any conference is an isolated activity, while teamwork is a continuous, sharing relationship.

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Since the sharing of ideas and plans is an essential part of the teamwork method of medical care, let us consider what one profession should know about another to participate intelligently and effectively in this type of relationship. There are four factors which are important:

(a) Appreciation of the field of competence of the other professions and what they offer to the medical therapy.

(b) Understanding of how the offering fits into the total plan of the doctor, when this service may be in demand, and what may reasonably be expected of the colleague in this specific instance.

(c) Information on the background and development of the other professions. This information may not be significant for specific data, but it lends status as well as aiding in creating a positive identification and builds a spirit of understanding and tolerance which is essential for good cooperative endeavor.

(d) A knowledge of the educational requirements for work in any of the specialized allied professions. On what aspects of medical care is the training of this colleague centered? This type of information makes possible a more objective assessment of the people representing the various professions.

With this background in the teamwork process, we will focus our attention on one of the allied groups to illustrate how teamwork can be developed to the enrichment and improvement of patient services.

SOCIAL SERVICE EXPERIENCE OF DIETETIC INTERNS

Few of the older, more established professions operating in hospitals traditionally view their part in the medical care of patients as an isolated unit. This applies to the hospital dietitian. The dietitian is expected to maintain nutritional standards in the hospital. Her training has included the social sciences, biology, education, nutrition, and dietetics. Her instruction has been focused on nutritional standards pertaining to health and disease. In her work in a hospital, her contacts are centered on food selection or the instruction of patients and students. Allied professions have recognized that the contribution of the dietitian can be elaborated.

At the University of Minnesota Hospitals, it was desired that dietetic interns learn more about the patients, both the out-patients and the hospitalized, and of their socioeconomic relationships. Therefore, a plan to include the social service department as a unit in their experience was developed. From the experience of having dietetic interns work in the social service department for the past five years, the benefits which accrue to the social casework from a relationship with allied professions have been demonstrated. Dietetic interns are assigned to the social service department to gain the following:

(a) Some knowledge of social work.

(b) A working knowledge as to functions of a social service department in a large hospital.

(c) An awareness of the importance of emotional problems in illness.

(d) An opportunity for contacts with patients.

The two-week program for the dietetic intern assigned to the medical social service is as follows:

She attends the staff meetings of the social service department where she participates in case discussions. She serves as a consultant to the medical social workers on problems of diet and may assist in the case work. In other words, while assigned to the department, the dietetic intern becomes a part of the professional staff and takes part in all of its activities.

The intern is assigned reading material to provide a background for the activities in which she participates and is given several current case records to read. These are analyzed as to what is considered the central problem and the contribution a nutritionist might make. Selected readings on public programs are also assigned.

In order that the intern may have a practical approach to the problems of food budgeting for people with small incomes, she studies the food budget of the State Division of Social Welfare and the Council of Social Agencies. She also makes budgets and prepares menus for families, using the allowances made to the public assistance recipients. In making the menus, the illness of the patient is considered. The intern supervises the menus of the privately owned boarding houses where out-patients live while attending the clinics, analyzing the foo ls served as to caloric count and basic nutritional values and serving as a consultant. She also visits the stores where the operators of the boarding houses trade to learn what foods are available and the approximate costs.

Each intern interviews twenty-five patients or their relatives. In these interviews she attempts to learn about the patients' food habits. She analyzes this material and tabulates the results. While conducting the interview, she gives instruction in normal dietary requirements and discusses any problems or questions the patient or relative may have regarding diet.

The assignment to the social service department amplifies the intern's understanding of the emotional problems in illness. She attends the children's psychiatric clinic and a conference on adult psychiatry to learn the problems and the manner in which the patients are treated. To supplement what the intern learns in this area, she is given an introduction to the important aspects of recreation and diversional therapy. A period of observation in the department of occupational therapy and one with the pediatrics recreation worker is arranged.

The intern also attends the staff conferences, case discussions, and special lectures with the students in medical and psychiatric social work. She visits one of the private agencies to observe the program in

which she is most interested. Where the agency is an institution, she talks with the dietitian. To supplement this experience, the intern may be assigned to a community social service agency.

After her assignment to the social service department, the intern will be more capable of fulfilling a job where she will participate in a teamwork relationship.

A CASE HISTORY

At the University of Minnesota Hospitals, the diabetic clinic is one of the areas which operates as a team and includes the physician, nurse, dietitian, and social worker. The following experience with one patient can illustrate the group teamwork.

The clinic dietitian had a sympathetic interest in people and desire to increase her understanding, but was completely baffled by a patient who failed to follow instructions with serious consequences. The doctor was a thoughtful, slow person, interested in his patients, and had a real conviction that with the right care they would improve. The nurse was trained in the dynamics of personality and spent adequate time becoming acquainted with the patients. The social worker held a kindly concern for people, and she assumed responsibility for bringing the social aspects of the condition of the patient to the team's attention.

Martha, a diabetic patient, was twenty-two years old and lived with her parents on a rented farm in a poor section of the state. She had attended the University Clinics spasmodically for twelve years. No problems were presented, and no attempt had been made to evaluate her illness in relation to her social situation. She was referred to the social worker in the diabetic clinic because she had requested help in finding employment to remain in the city for medical care. Her parents were old, and she was positive in her desire to be independent of them. Her medical status showed that a progressive eye condition, diabetic retinitis with cataracts, was more serious than the diabetes, and the medical history revealed that the diabetes had not been controlled. Instruction had been given to the mother, who was conscientious in following recommendations, but the patient was uncooperative. When complications developed and she was hospitalized, the social worker had an opportunity to become acquainted with the family.

They were the only Dutch people in a completely Scandinavian settlement. They were industrious, although frequently pressed financially. The other children resented the patient because of her expense and their subsequent sacrifices. It was necessary to apply through the county welfare board for help, which was a blow to the family pride.

The mother was a quaint, well-meaning person, religious and exacting. She had a feeling of guilt at the overprotection of the patient and the family sacrifices demanded. The antagonisms of her other children because of this favoritism was a cause for concern.

The patient made a good appearance and gave the impression of being an easy, outgoing person. Subsequent interviews brought out a great hostility towards her illness, her parents, and all clinics. She expressed guilt over the family sacrifices and disturbance over her rejection by her sisters and brothers. She spoke with bitterness about childhood memories when she was served a selected diet and the family had only a meager meal. She showed great ambivalence between wanting to be independent and fear of separation from her parents. She assumed no responsibility for her diet which was left to her mother.

After discharge from the hospital, the patient revealed immaturity and was in conflict. She was approaching a serious problem when she would lose her eyesight, and employment at that time was no solution.

To handle the problem better, a conference was held with the consulting psychiatrist. The psychiatrist advised that effort be directed to assist her to accept her physical condition and its limitations. He recommended that she have positive support in her expressed desire to become independent even though she was not ready for that goal. She required someone in her local community with whom she could discuss her problems. The social worker referred her to the Vocational Rehabilitation Department, which would lend recognition to her wish to be self-supporting. The public health nurse was requested to assist. Thus the social worker initiated another team in this one community, made up of the public health nurse, vocational counselor, and local doctor. The patient was to continue treatment in the out-patient clinic.

The clinic personnel became frustrated after reading the medical notes. They were convinced that this patient was not interested in controlling her condition.

The social worker accepted the responsibility for interpreting the social situation to the doctor and nurse. The importance of the dietitian in the team was emphasized. Over the years, the patient and her mother had had more contact with the clinic dietitian than with anyone else. Since the mother was inclined to take over the conversation, the dietitian had always directed the discussion to her. The patient became hostile to the dietitian and identified her with the mother. She resented the fact that the dietitian failed to recognize her as a capable, mature adult. The dietitian changed her approach. She accepted the patient, was positive and casual in her relationship, brought no pressure when recommendations were not followed, but assumed in a general way that the patient was intelligent. The patient attempted to develop a dependency which seemed to be almost a transfer of the feeling toward her mother. However, through cooperation with the social worker and the doctor, the dietitian was aided in the control of this complication.

The team provides a medium for checking impressions and observing behavior. When the social service and the dietary departments work together, there is a freedom of discussion and a modification of the functional technique. Recognized status of the workers in both fields is a rewarding factor in professional teamwork. The benefits are far-reaching beyond the original group, frequent hospitalization of patients is controlled, and patients are propelled toward the restoration of self-esteem, and in many instances independence is achieved.

Radiation May Aid in War on Trichinosis

Trichinosis, usually transmitted to man by eating infected undercooked pork, affects about 16 per cent of the population of the United States. Radiation, however, it has been found by the Hawaii Agricultural Experiment Station, may stamp out this infestation. The amount of radiation (roentgens) necessary to render the *Trichinella spiralis* sterile, thereby insuring the susceptible host against muscle infestation, has been determined. This treatment also makes encysted trichinae larvae in the meat inactive and incapable of further development in the host.

Can We Afford Quality in Our Food Products?[1]

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WHEN I was a boy, my mother kept her family of five healthy with apple sauce, canned fruits and vegetables (mostly produced in our garden), and plenty of meat. Of course, we had large quantities of dairy products—milk, butter, and cottage cheese. But when I established my own family a quarter of a century later, these things were not sufficient. Orange and grapefruit juice for breakfast, fresh salads for lunch and dinner, and fresh strawberry shortcake in December had all become the "order of the day." As a result of this change, today we enjoy better and more attractive meals and a healthier population, but they do take a large slice of the family income. Much of this change in national food habits can be attributed to dietitians, for you have shared your advancing knowledge about foods with the American family.

WHAT IS QUALITY?

I would, however, like to ask a number of questions about this change in our standards of quality. In the first place, what do we mean by "quality"? Does or should quality in foods reflect nutritional value, uses, condition, or what?

We all know that on a rainy day many of the eggs produced from farm flocks get dirt on the shells. These "dirty" eggs sell for considerably less than clean ones. They are not classified as Grade A. But has their nutritional value been damaged in any way? I doubt it, but certainly appearance does count.

Another question is: To what extent does quality, as we now use it in grades, reflect what consumers actually want? Or does the quality expressed by grades reflect what some specialist *thinks* the consumers want? Many farmers argue that grades are what specialists think the consumer wants and are developed for the sole purpose of making it difficult for them to sell their crops.

The sweet potato producers in Jefferson County, Kentucky, like those of Louisiana, want to sell as many of the sweet potatoes dug as possible. That is only natural. Yet a U. S. No. 1 grade sweet potato must be at least 1.75 in. in diameter and not exceed 24 oz. in weight. Thus a sizable proportion of the crop each year is either too small or too large to meet these specifications, although the food value of the various sizes is the same. In fact, the large ones show a waste of only 8 to 10 per cent in preparation while the smaller ones show more than twice that amount. But does the housewife buy these off-sized sweet potatoes even at reduced prices? No. In an experiment in Pittsburgh conducted by the Department of Agricultural Economics, Louisiana State University, Baton Rouge, the large sweet potatoes could not be sold for enough to pay the freight. In Louisville, we tried to sell them at 3 lb. for 10 cents in competition with the U. S. No. 1 size at 3 lb. for 29 cents, and we failed. In this case, the specialist is correct in insisting that size is an important grade factor. Nevertheless, it does not take into consideration food value or cost of waste.

In grading meat, the factors of color and of distribution of fat are important. How realistic are these factors? Most of us want lean meat. However, Prime grade beef has so much fat that most of it is wasted. Few people would buy a Prime steak just because of the large amount of fat on it. Nevertheless, our grade standards still require that fat is needed for the Prime grade. What about nutritive value? Do steaks with large quantities of wasted fat have more food value than leaner ones?

Is the color of the meat and fat so vital? Does dark red meat have more food value than lighter meat? Does white fat make the meat more desirable from a nutritional standpoint than yellow fat? Or, is light pink veal better than reddish veal? A strictly milk-fed calf will produce light pink veal, while one that has been fed on grain or allowed to graze for any length of time produces a reddish veal. Feed changes the color of the meat, but does it change the food value?

You may wonder why I have raised all of these questions concerning the grade standards for many of our food products. How sound are our present standards of quality? With some products, age is considered; with others, factors such as dirty shells,

[1] Presented before the Kentucky Dietetic Association in Louisville, on March 26, 1952.

fat distribution, color, size, bruises, and other minor defects are important. We should endeavor to come to some kind of an agreement on the kind of quality we wish to maintain during the marketing processes. Do we want color, shape, cleanliness, freshness, crispness, or something else? Generally speaking, should we consider that a ripe tomato on the vine is at its best and then try to duplicate as nearly as we can that degree of ripeness on the vegetable display case in the retail store? If so, by the same reasoning, the unaged cheese or freshly hung meat would be considered top quality from the standpoints of appearance, palatability, and nutrition.

Incidentally, the tomato is an interesting vegetable or, according to botanical terms, a fruit. It reaches maturity some time prior to turning red, and at this stage tests show it has about all the food value it will ever have, but the proper taste has not yet developed. Another strange thing about the tomato is that it turns from green to red from the inside out. Did you ever cut a tomato that was just beginning to show red coloring on the skin? Or did you ever see a sliced tomato with a green center? Rarely! It is this peculiarity of tomatoes that has made it possible for us to have them on the fresh vegetable counter the year around. It is during the mature green stage that tomatoes can be picked and shipped with less risk of damage than when they are fully ripe, for they are hard and firm and will continue to turn red during shipping. These tomatoes have a very mild flavor; in fact, those of us who like vine-ripened tomatoes call them tasteless. Actually, many city dwellers prefer them and say the vine-ripened ones are "strong."

CHANGES IN MARKETING PRACTICES

Let us recall some of the ways that our food products were handled during the early part of the century.

Milk was distributed throughout the small villages and even some larger towns in cans and pails. The producer drove down the street, and the housewife came to his wagon with a pan. The milk was dipped out of the can and poured into the pan. Often the dippers or cans were not too clean, or the wind was blowing and dust in the air settled into the can or the milk. Later tin buckets came into the picture. The buckets were taken into the houses and emptied into pans there. Also, the bulk of the product was raw milk. Perhaps the cows were healthier in those days, or else no one realized when they were diseased. At any rate, today, under the regulations of most places, we receive much purer milk. It comes from tested herds. In addition, it is pasteurized and bottled by sterilized machinery and covered not only by a cap, but also by a hood, in order to keep the bottle tops clean—or, it is packaged with equal care in paper cartons.

Eggs, another common and widely used commodity, were formerly collected on farms and allowed to stand in the pantry or cellar to be brought to town once or twice a week. In the stores, they were displayed in buckets or baskets. Some were clean eggs, others were not. We realize that newly laid eggs are preferable, but it takes time to move them through marketing channels. We have found out many things about eggs during the past decades. The dirty egg mentioned earlier is just as good as a clean egg when it is gathered, and as it was marketed fifty years ago, it remained as good. Today, however, the farmer's wife, knowing that it cannot be sold for as much money as a clean egg, washes it and in so doing she damages it. Nature has tied that egg up in a fine package to protect the contents from outside contamination as well as to prevent the inside from deterioration. Washing removes a protective covering and allows certain odors or tastes to be more readily absorbed by the egg. Also, it allows evaporation of the contents. If the washed egg is used quickly, no harm is done, but if it is to be moved to a distant market or placed in storage for future use, the results are often disastrous. That is why we pay a premium for clean eggs.

Also, we know that the temperature at which eggs are kept affects the quality. The higher the temperature, the shorter the life of the egg. That is why most grocery stores now display top-quality eggs in refrigerated cases and lower-quality eggs in baskets. In fact, one of the largest chain grocery organizations never holds eggs, even in the refrigerated cases, more than a week. If they are not sold by then, they are taken out of the cartons and displayed in baskets at a reduced price.

VEGETABLE MARKETING

Perhaps more rapid advance has been made in preserving the quality of fresh fruits and vegetables than in many other lines of food. Not so many years ago, oranges and bananas were about the only fresh fruits available at Christmastime, and perhaps onions, potatoes, cabbage, and sweet potatoes were the only vegetables. Peaches, pears, beans, peas, and tomatoes were the canned fruits and vegetables available in the off season. Fresh fruits and vegetables were available only during the short season when they were being produced in the immediate locality. Today, however, many of these vegetables and fruits are on the shelves of the grocery store every day of the year. The shipping and marketing practices which make this possible deserve explanation.

Do you realize, for instance, how difficult it is to get sweet corn to you so that it is fit to eat? Many Kentuckians, for many years, ate white corn-on-the-cob—those large ears of horse corn. It was regular field corn picked in the milk stage before the kernels had developed much food value. Such corn stays tender because it contains little starch or sugar. What happened when the switch to yellow sweet corn was

made? To those accustomed to the horse corn, the new corn probably seemed sticky and gummy. Why? Because it is not harvested until it is nearly mature, and the sugar content is high. Under certain conditions, this sugar rapidly changes to starch.

Generally speaking, this yellow sweet corn can be kept about a week with but a small deterioration in sugar content, provided it is held at a temperature below 50°F. However, with each rise of 10° in temperature, the holding time is cut in half. Thus at 60°, holding time is 3½ days; at 70°, 42 hr.; at 80°, only 21 hr. We must remember that during the summer when sweet corn is in season, temperatures are normally in the 80's and 90's. Sweet corn quality *can* be maintained, however, if the producers take the field heat out quickly after picking or pick the corn in the early morning before it gets hot, then rush it to market, and the retailer keeps it cool until sold. The housewife must also do her share by taking care of it until it's cooked.

How does the sweet corn we see in March reach the shelves in such good condition? It is produced in Florida, picked, and placed on an endless belt which takes it into a trimming and packing shed located on a truck. The truck moves the shed through the field at the same rate as the pickers. After packing, the corn moves out of the shed on another belt into a refrigerated truck. Growers claim that the corn is under refrigeration within 20 to 30 min. after being picked, then on the way north in refrigerated trucks within 8 to 10 hr., and after a 24- to 36-hr. ride reaches northern consuming centers. Thus the corn raised in Florida reaches the markets in about two days' time. It has been refrigerated almost from the time of picking.

Now, compare that with the usual methods used locally. Corn is picked in the morning, packed into bushel baskets in the afternoon, and taken to market that evening or the next morning. It may reach the retail store 24 hr. after picking, but it is more likely to be 48 hr. later and with no refrigeration. What happens is to be expected: the result is tough gummy corn unfit to eat.

PACKAGED VEGETABLES

Other vegetables marketed under completely different conditions today are spinach and kale. Both were formerly pulled up, washed slightly, and the sand and dirt along with the plants were displayed at the grocery store. Most of us did not buy it, for we didn't want the disagreeable task of getting the dirt and sand out of it. Today the spinach leaves are clipped, and the roots and dirt are left in the field. The leaves are then washed, dried, and packed in plastic bags. These bags are supposed to maintain the moisture content and prevent deterioration. The modern consumer gets a much higher quality product.

This brings up the question of packaging fruits and vegetables. Even though nature has wrapped many of our fruits and vegetables in excellent self-coverings, we as buyers do not respect them. In one test in a chain store, some 25 per cent of the bulk apples were damaged by buyers to such an extent that they were a complete loss. By packaging these apples, losses were reduced to a very small percentage.

The tomato was one of the first vegetables to be packaged. Tubed tomatoes did two things: they increased the sale of off-season tomatoes and made it possible to get a much higher percentage of the crop to consumers. Especially in self-service stores, there was much damage by customers to tomatoes. The buyer would pick up the tomato and punch it with a thumb or finger. The bruise soon decayed, and the tomato became garbage. Did you know that in some of the southern states a study showed that only slightly more than half of the tomatoes produced by farmers ever reached the consumer? The remainder was lost during marketing.

In the next decade I expect that almost all of our fresh fruits and vegetables will be sold in packages. But as we change to packaging, there are three things that must be kept in mind: first, only quality merchandise can be packaged if confidence is to be established and retained; second, there must be some visibility to the package; and third, the cost must not be more than for the same type of merchandise in a bulk form.

Consumers, however, will not accept all vegetables in packages. One notable example is sweet potatoes. Although they are well suited for packaging, the habits of the housewife prohibit it. Sweet potatoes must be of about equal size and shape to bake in the same length of time, and buyers select just one sweet potato for each member of the family when purchasing. Evidently left-over sweet potatoes are hard to use.

REFRIGERATING AND TRANSPORTATION ADVANCES

I could continue with other fruits and vegetables, but perhaps we should examine some of the things that make it possible to get these products to consumers in the fresh state they like and preserve the food value that nature placed into them. The marketing of many foods is a race with deterioration and decay. This should be clearly recognized because it helps us to understand the need for speed and proper handling during the marketing process.

The first great improvement that has made this possible was the advancement of refrigeration. Certainly ice was used many years ago, but how? When I packed lettuce in Colorado one summer two decades ago, we chopped up ice into small chunks and placed it in and around the crates. Care was taken not to get the crates or lettuce too damp. Now the ice is shaved into snow and blown under pressure into and around the crates so that it gets into all cracks and

crevices. I have even seen water poured on it so that ample moisture is available to keep the leaves crisp. The freight cars and trucks are also much better insulated today than they were even a decade ago. Mechanical refrigeration coupled with this "snow ice" does wonders to maintain the freshness of the vegetables.

A second change that helps materially is the flexible, speedy transportation that enables us to move the produce from distant growing areas in a much shorter time. In an experiment a couple of years ago, tomatoes were brought to Louisville from California by truck in slightly less than four days. It takes seven to eight days by rail. Strawberries and peaches have been flown from producing areas to distant consuming areas in a matter of hours. In fact, strawberries picked one morning in Florida have been served for breakfast the following day in New York City. With large trucks there is less handling, loading, and unloading, during all of which much bruising and damaging occurs. Trucks also ride much more smoothly and with fewer sudden bumps than do freight cars.

The speed of present-day transportation needs to be emphasized by itself. Today it is not uncommon to find the delivery time of a few years ago cut in half. I have already mentioned the speed in shipping early Florida corn to the North.

BETTER HANDLING METHODS

The fact that wholesalers and retailers realize the need for better methods and more care in handling fresh fruits and vegetables is a great help. Modern wholesalers keep those fresh fruits and vegetables that need refrigeration in cold rooms with moisture controls from the time they are received until they are delivered to the retailer. Some are even delivered in refrigerated trucks. Of course, we have all seen the large refrigerated display cases in the supermarkets. Many have beds of ice for moisture and cold air circulating up through the vegetables. The old display cases were just shelves. The first advance was perhaps a tin pan placed below them so that some water could be sprinked over the vegetables. The next improvement was a spray attachment which kept the vegetables moist. But now we see these long refrigerated cases that really do an excellent job of maintaining that crispy look and feel which makes fresh vegetables so good.

We have also learned a good deal about the nature of various vegetables. Do you remember when the potato was displayed in bins or racks or in sacks in the front window where the light was bright? We now realize that when so exposed, they develop a green color and are not acceptable. Thus today we usually find them displayed in the back of the store in a darkened corner—a new technique in marketing.

SUMMARY

In closing, I think the aim of the merchandiser of fresh fruits and vegetables is to bring them to the consumer in the highest state of perfection possible. It must be recognized, however, that to maintain this standard of quality for food products through the marketing process means raising costs. How far should we go in maintaining quality and thereby increasing costs? How much more are all or part of the consumers willing to pay? Also, other questions that might be raised are: Who benefits from the higher quality? Does the consumer benefit by getting more nutritional products? Does the producer benefit by getting higher net returns? Has our insistence on high quality which is based to a large extent on freshness and appearance resulted in prohibiting the low-income group from obtaining needed variations in their diets?

Those are some questions that need to be answered. Only through research and close attention to such problems by dietitians and similar groups can we find satisfactory answers—answers which will let those of us interested in marketing know just how far we should go in endeavoring to maintain the quality of our food products, even though we may realize all too well that to maintain this quality must also increase costs.

Weight Reduction in Hypoglycemia

The diet for an overweight person with hyperinsulinism (spontaneous hypoglycemia) differs little from the low-calorie (1250 calories) reducing diets generally prescribed by physicians. It should be low in carbohydrates and high in proteins, with a limited amount of fats. The ingested food should be divided into three small meals a day, an egg for breakfast, fish or other seafood, or cheese and crackers for lunch, and lean meat in liberal quantities for dinner. An abundance of vegetables containing 3 or 5 per cent carbohydrate may be eaten for lunch and dinner. Fruit or fruit juices (orange, apple, or grapefruit) should be taken for breakfast, every 2 or 3 hr. between meals, at bedtime, and, if awake, in the night.

Such a patient should be particularly careful to avoid fatigue and requires rest in bed 8 or 9 hr. at night and from half an hour to an hour after the noon meal. He should not drink more than one cup of coffee a day. It is particularly important to eliminate sweets and cane sugar products of all kinds, since they stimulate the secretion of insulin and are, therefore, harmful. The cola-caffeine-containing soft drinks are an important cause of hyperinsulinism and should be eliminated. Beer and all other alcoholic beverages, when used regularly or excessively, because of their effect on the liver, cause spontaneous hypoglycemia. Total abstinence is advisable.—*From: Queries and Minor Notes, J.A.M.A., 149: 1174 (July 19), 1952.*

Psycho-Motor Performance Related to Vitamin Intake[1]

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RECENT research in human nutrition has shown the importance of standard techniques of observation. Cooperative efforts of investigation from related fields of nutrition and psychology have been successful in several studies involving human nutrition and performance. The present investigation was planned with the primary objective of determining whether changes in motor performance could be related to changes in nutrition.

EXPERIMENTAL PROCEDURE

The Method

A miniature airplane, mounted so that it was free to reproduce flying maneuvers when set in operation, was used to test the motor skills of the subjects. They attempted to keep the plane in level flight by manipulating hand and foot controls involving complex body movements (see illustration). Performance was then measured by the number of errors recorded on electrical counters.

This test had been carefully evaluated by Van Dusen (1) as an instrument for the selection of Air Force pilots. Ivy and Seashore (2) have used the test in a study of fatigue, and Horwitt *et al.* (3) have used it in a large-scale study in human nutrition.

In the study of Ivy and Seashore, the device was used to investigate the value of drugs in relieving military fatigue. Various motor tests were employed; however, the miniature pursuit plane provided the most sensitive means of distinguishing between drugs. Horwitt *et al.* found that the test gave significant results in measuring performance as affected by deficiencies of certain vitamins of the B-complex.

Previous tests of motor skills which have been used in studies of nutrition have afforded motion in one or two planes of movement. The motor pursuit plane test involves movement in three planes of motion. Thus, the possibility that the instrument might be useful in a study of individuals ingesting the average diet, both with and without supplements, was suggested.

The plane test in use.

The Subjects

In the main, the subjects were selected from students attending day and evening classes on the Chicago Campus of Northwestern University. However, resident physicians, laboratory technicians, clerical employees, and a few patients at the Clinic also served as subjects. Patients were not included when their medical records disclosed serious pathology. Sixty-five persons in all were interviewed. Data were collected for 50 of the original 65 interviewed, but

[1] Presented in partial fulfillment of the requirements for the degree of Master of Science, Northwestern University by Raymond F. Smith. Received for publication May 21, 1952.

[2] The authors wish to acknowledge the courtesy of Dr. Bertha Shafer and Dr. Franklin Fitch of the Louis Schmidt Clinic of the Medical School, Northwestern University, who made this study possible. Dr. Albert Van Dusen, Department of Psychology, advised throughout the study, and Professor Ruth Bonde, Head, Home Economics Department, aided in the planning of the study. The writers also wish to express their appreciation to the many subjects and other interested persons who aided the work.

the records of only 40 were considered complete enough for evaluation.

The average age of the experimental group was 33 years; that of the control group was 27 years. Thus, the factor of youth was slightly in favor of the controls.

Dietary records were obtained for all subjects for the week following the first interview. Thirteen of the 21 subjects (4 women and 9 men) who received the supplements provided adequate dietary records throughout the study. Twelve of the 19 controls (4 women and 8 men) provided complete dietary records.

The performance of the subjects with the plane test was determined during the first interview and thereafter once weekly for two successive weeks. This served as a period of standardization and allowed each subject to set his own level of normal performance. The control subjects had slightly less errors during this period.

During the initial two weeks, the project was explained to the subjects by both the psychologist and the nutritionist. At the end of this period, the six-week experimental period began. During this period a dietary supplement consisting of twelve cereal grass tablets and a multiple vitamin capsule[3] were given daily to 21 of the subjects (6 women and 15 men) and placebos to the 19 controls (5 women and 14 men).

During the first two-week period, the dietary records were studied. However, the composition of the diet was not the basis for the division of subjects into control and experimental groups. Rather, as suggested above, the subjects showing a greater number of errors received the supplements. The initial difference between the two groups may be seen in Figure 1.

[3] The Abbott Laboratories and E. R. Squibb and Sons provided the multiple concentrates and placebos; the Quaker Oats Company provided the cereal grass tablets.

RESULTS

As noted above, the group chosen to act as the controls showed fewer errors during the initial two weeks. After one week of supplementation they lost this lead, and the experimental subjects receiving the supplements continued to show fewer errors for the remaining five weeks of study. However, as may be seen from Figure 1, this advantage was slight and not statistically significant.

The variability in error made by each group was compared for each of the eight weeks. This proved to be a more significant measure of change in performance. This is shown in Figure 2. Note the highly significant drop in variability of performance of the experimental subjects during the second week of supplementation. This difference could be expected to occur by chance only 1 in 10,000 times.

Personality profiles for the Minnesota Multiphasic Personality Inventory were compared before and after the diets were supplemented. The most complete profiles for half the subjects in each group, upon comparison, showed that the experimental group experienced a significant reduction in depression, mean scores dropping from 55.2 to 48.7. The mean score for the control subjects stayed at 53, although they averaged six years younger than the experimental subjects. Thus, the supplemented subjects felt less depressed at the conclusion of the study than the general population (average 50). They also showed some improvement beyond control subjects on scales measuring relative hysteria, hypochondria, and normal masculinity-femininity balance.

DISCUSSION

Nutritive Implications

Information concerning the diets and the influence of the supplements does not warrant the conclusion that the change in the variability of the errors for the group receiving the supplements was due to improved nutrition. However, the diets offer much material for speculation.

FIG. 1.

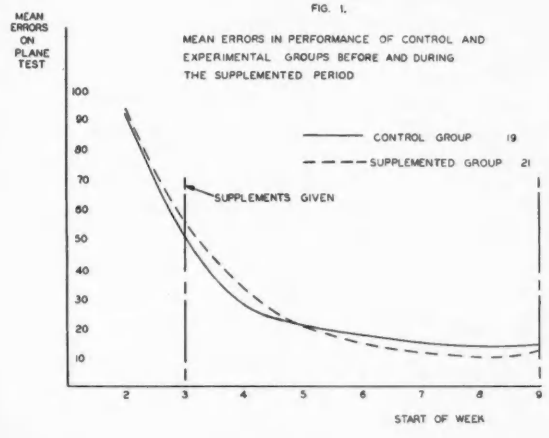
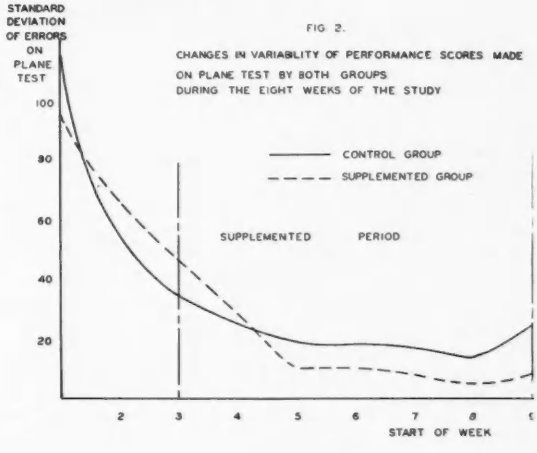


FIG. 2.



During the initial period, the diets of most of the subjects seemed reasonably adequate. The caloric value as calculated, however, was approximately 25 per cent below that recommended by the Food and Nutrition Board of the National Research Council (4).

The main interest of the investigators was with thiamine, riboflavin, and niacin. However, other nutrients were considered. According to calculation, the average regular, unsupplemented intake of thiamine, riboflavin, vitamin A, and ascorbic acid for the experimental group was in close agreement with the allowances of the National Research Council during both periods. The added effects of the supplements may be seen in Table 1.

The diet of both groups was approximately the same before supplementation. The average intake of five vitamins may be seen in Table 2. According to calculations, the diets of the women deviated more from the recommendations of the National Research Council than those of the men. Ascorbic acid and vitamin A intakes for both sexes were below the allowances of the National Research Council. Obviously the diets of some of the subjects were considerably lower than the average. The more generous diets of some of the subjects raised the average without contributing anything to those whose diets were less generous.

TABLE 1

Vitamins in daily supplements given to experimental group

SUPPLEMENT	VITAMIN				
	Vitamin A	Thiamine	Riboflavin	Niacin	Ascorbic acid
	I.U.	*mg.*	*mg.*	*mg.*	*mg.*
Vitamin tablet	5000	3.00	3.00	20	75
12 cereal grass tablets	3000	0.05	0.15	0	18
Total.....	8000	3.05	3.15	20	93

Possible Sources of Error in Dietary Records

It is recognized that there are several factors to be considered in evaluating the reliability of the calculated values for nutrients.

According to Norris (5) there are four main methods of making dietary surveys, each of which has several modifications.

The survey method is applied to relatively large groups. However, the techniques which are applicable to dietary studies of smaller groups are similar to those of the survey. The four methods which are most frequently used with smaller groups are:

(a) Analyzing chemically specially weighed samples of food intake.

(b) Weighing of portions of food consumed and the subsequent calculations of the nutritive value, using tables of food composition.

(c) Questioning of informants or the participants of the survey.

(d) Keeping of daily records of the food consumed by the participants.

Method four was used in this study, with daily food records kept by the participants. Prepared forms were used, and the records were neatly and completely kept through the fine cooperation of the volunteers. The dietary histories of these subjects showed much room for improvement in their regular daily diets, although they seemed to be in average good health. A detailed account of the experimental method, the diets of individual subjects, and other

TABLE 2

Average vitamin intake of subjects during preliminary and experimental periods

NUTRIENT	INTAKE		INCREASE DUE TO SUPPLEMENT	COMPARISON WITH RECOMMENDED DIETARY ALLOWANCES		
	Preliminary period	Experimental period		Allowance	Deviation during preliminary period	Deviation during experimental period
Men						
			%		%	%
Vitamin A (I.U.)	6,208	14,208	56.3	5,000	+24.2	
Thiamine (mg.)	1.46	4.51	67.5	1.5	+2.6	+184
Riboflavin (mg.)	2.14	5.29	67.51	1.8	+18.9	+194
Niacin (mg.)	13.00	33.00	60.7	15.0	−13.3	+120
Ascorbic acid (mg.)	99.00	182.00	51.1	75.0	+32.0	+143
Women						
Vitamin A (I.U.)	10,015	18,015	44.4	5,000	+100.3	+260
Thiamine (mg.)	1.64	4.69	65.4	1.2	+36.6	+121
Riboflavin (mg.)	2.22	5.37	50.9	1.5	+48.0	+258
Niacin (mg.)	11.70	31.70	—	12.0	−2.5	+164
Ascorbic acid (mg.)	88.00	181.00	63.1	70.0	+25.7	+159

technical data can be found in the detailed report of this study (6).

With the exception of chemical analysis, each method makes use of tables of food composition in arriving at the nutritive value of the food consumed. In using records of food consumed where weights and measurements are not involved, the assumption is made that the portions are of "average size." At best this is unreliable, since both in the home and in public eating places differences are found in the average serving.

Then, too, the maximum conservation of nutrients is seldom attained during the cooking of food. As an example, Sarett *et al.* (7) have found that the loss of thiamine, as the result of cooking carried out in the kitchens of public eating places, may be from 50 to 90 per cent and that of ascorbic acid may be from 43 to 99 per cent.

In addition to the cooking losses, there are differences in the composition of food as purchased.

All of these sources of error, then, should be considered when dietary records and food composition tables are used to determine the nutritive value of diets. We may thus assume that the intakes of the nutrients considered here did not in each case attain the National Research Council allowances as calculated. The 20 per cent correction applied to the calculated value of the nutrients, to allow for some of the above losses, seems a modest and conservative one. Since the supplements contained one to two times as much of the nutrients under study as did the diet, they predominate as a source of nutritive value and the influence of errors in dietary calculations is minimized.

Thus, it seems reasonable to assume that the nutrients considered in this study may not in each case have been present to the extent calculated. More precise methods of studying the composition of the diet may show the miniature tri-motor pursuit plane a delicate means of detecting dietary inadequacy.

Future Implications

Two immediate uses of more sensitive devices such as the plane test are suggested for nutritional research. First, we may be able to measure the time required to detect favorable responses following nutritional therapy. Second, we may be able to detect which of several nutritional factors has the greatest effect upon performance. Thus, some research basis would exist for a recommendation to practicing physicians and nutritionists.

It was the cooperation of physicians, nutritionists, and psychologists which made this study in human nutrition and performance possible. The results indicate that a more complete picture has thereby been gained of some of the factors affecting performance, personality, and health.

Cooperative research may identify physical and mental conditions which remain greatly independent. More light may be shed on metabolic processes occurring within deep levels of the body; their relationship to psychologic processes existing at deep levels of the mind is still unknown.

This study was intended to be merely exploratory in nature. More precise and extensive evaluation must await more professional research and judgment.

Research in nutrition and metabolism is complex, expensive, and time-consuming. The economy in costs and time of sensitive tests, such as the plane test, should make them useful in further investigations into this area.

CONCLUSIONS

The data obtained in this study cannot be presented as conclusive evidence that the diets were either deficient or adequate. Limitations of the study preclude definite conclusions.

Improvement in scores on the miniature pursuit plane test was slight; however, decrease in the variability in errors was highly significant. Thus, the value of the test seems to be indicated. Further application of the test, in combination with chemical analysis of diets providing various levels of nutrients, is recommended.

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Ascorbic Acid Needs of Older Adolescents

New data for basing recommendations for dietary ascorbic acid for adolescents have been reported by the Oregon Agricultural Experiment Station. The National Research Council's tentative allowances of 100 mg. for eighteen-year-old boys and 80 mg. for sixteen- to nineteen-year-old girls did not maintain mean values for blood plasma ascorbic acid as high as the means obtained when saturation doses were given.

Comparison of Some Constituents in Fresh-Frozen and Freshly Squeezed Orange Juice. II.[1]

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IN 1950, a study was instituted to obtain values for some thirty-two constituents in the juice of freshly squeezed and reconstituted fresh-frozen orange juice (1). Further studies were continued in 1951, for which the collection and processing of whole oranges and of fresh-frozen orange juice concentrate[2] obtained from ten different cities were carried out as previously, *except* that the ten individual samples of juice were not pooled prior to analysis. Instead, each sample of reconstituted fresh-frozen orange juice and each sample of fresh juice was analyzed separately. Obviously, there is no basis for assuming that the samples of fresh-frozen orange juice were representative of all brands of frozen concentrates, or that the fresh oranges purchased at one time (May 1951) would represent varieties available throughout the year. The results presented must be viewed as subject to these qualifications.

EXPERIMENTAL PROCEDURE

As in the previous study, official A.O.A.C. (2, 3) methods were used except in cases where an official method was not available or was unsuitable under the conditions of this investigation. The official method was used for: *calcium*, *folic acid* (microbiologic method), *phosphorus*, *riboflavin*, *sulphur*, and *thiamine*.

In other instances, the experiments were carried out utilizing a procedure which gives reasonably accurate results. At this time it should be emphasized that the chief object of this investigation was a comparison between reconstituted fresh-frozen orange juice and orange juice freshly prepared. Therefore, even when absolute values were not obtained, the results are of value for this type of study.

The following methods for other constituents were used:

Ascorbic acid: Determined by the method of Bessey and King (4).

Betaine and *choline:* After deamination of the orange juice with nitrous acid or calcium hypochlorite, betaine and choline were adsorbed on a column of Amberlite IR-120. The column was then thoroughly washed with water until the washings gave a negative test for carbohydrate (Molisch reaction). The betaine was then eluted by means of 4 per cent aqueous ammonia, and after removal of the ammonia by concentration *in vacuo*, the betaine was determined colorimetrically as choline reineckate.

Biotin: Estimated after hydrolysis with 6 N sulphuric acid by the method of Wright and Skeggs (5).

Cobalt, *copper*, *iron*, *magnesium*, *manganese*, and *potassium:* Usually estimated by spectrographic procedure (6), although in a few instances the results were confirmed by chemical methods (2, 3, 7).

Inositol: Estimated microbiologically using *Saccharomyces cerevisiae* after hydrolysis with 4 N sulphuric acid (8).

Iodine: Determined by ashing a 10-ml. quantity of juice in the muffle furnace at 750°C. for 60 min., dissolving the ash in distilled water, and then determining iodine in an aliquot by the method of Barker (9) modified by the use of a 250-ml. distilling flask instead of a 500-ml. The results were corrected by running blanks on the reagents, since iodine-free reagents are almost impossible to obtain.

[1] This work was done with the cooperation of and in part under the direct supervision of I. S. Kleiner and R. J. Block, Department of Biochemistry, New York Medical College, Flower and Fifth Avenue Hospitals, New York City. Received for publication November 26, 1951.

[2] The fresh-frozen orange juice was Minute Maid, Florida packed.

Niacin: Estimated by both chemical and microbiologic procedures (10, 11).

Nitrogen, total: Determined by the procedure of Block and Bolling (12). *Nitrogen, amino:* Estimated by the Van Slyke ninhydrin procedure (*cf.* 12) after removal of volatile nitrogenous constituents. *Nitrogen, volatile:* Estimated by distillation from a mildly alkaline medium into boric acid and subsequent titration. *Nitrogen, non-volatile:* Calculated.

Pantothenic acid: Determined by the method of Skeggs and Wright (13), after liberation with intestinal phosphatase plus chicken liver and by the method of Jukes (14).

Para-aminobenzoic acid: Estimated by a modification of the Neurospora method of Thompson *et al.* (15).

Pyridoxine: Determined by the methods of Stokes (16) and Atkin (17).

Tocopherols: Determined according to the procedure of Emmerie and Engel (18).

Vitamin A: Determined by Dann's method (19).

Vitamin B_{12}: Estimated by the use of *Lactobacillus leichmannii* (20).

Amino acids: Qualitative two-dimensional chromatograms of the amino acids (*cf.* 12) in fresh and reconstituted orange juice were carried out after removal of the carbohydrates by means of the cation-exchange resin, Amberlite IR-120 (*cf.* betaine and choline above).

RESULTS

The results of these analyses are listed in Tables 1 and 2. The ranges given in Table 1 are those found by three teams of investigators who studied three different pooled samples of reconstituted frozen and freshly-squeezed juice. Table 2 represents results obtained by assaying individual samples, but the materials assayed were divided among the three laboratories rather than as previously when each laboratory assayed for each constituent. This probably accounts, in part at least, for the smaller range of values reported in the present study and for the fact that a number of the assays fall at one extreme of the previously reported range. Although every attempt was made to utilize the best available technique for each substance, it should be recognized that many of the reported values have greater *comparative* than absolute significance.

One may observe from the data in the tables that for a large number of the components studied there were no significant differences between those found in freshly squeezed juice and reconstituted fresh-frozen orange juice, regardless of whether a pooled sample or an individual sample was assayed.

The data in Table 2 suggest that there may be a significant difference in the *mean values* for iodine, manganese, potassium, vitamin A,[3] and vitamin B_{12} between fresh-frozen juice and freshly squeezed juice. The former was somewhat higher. The home-squeezed juice showed appreciably higher values for calcium, and higher values for nitrogen, magnesium, and pyridoxine.

In many of the hematopoietic elements, as for example, iron, cobalt, and folic acid, the fresh-frozen orange juice showed values sufficiently close to those of freshly squeezed juice to be considered similar. Most of the B-complex constituents appeared to be present in both fresh-frozen and freshly squeezed juice in approximately the same concentrations; i.e., thiamine, riboflavin, para-aminobenzoic acid, pantothenic acid, niacin, choline, and biotin. It appears that the mean value for inositol in freshly squeezed

[3] Vitamin A was considered to be those substances reacting with the antimony trichloride under the conditions recommended by Dann (19) after correction for the "blue value" given by carotenoids.

TABLE 1

Ranges of values in pooled samples (1950)

COMPONENT	UNITS	FRESH-FROZEN, RECONSTITUTED ORANGE JUICE	FRESHLY SQUEEZED ORANGE JUICE
Biotin	mcg./100 ml.	0.09– 0.23	0.12– 0.28
Calcium	mg./100 ml.	9 – 11.2	10.2 – 14.0
Choline	mg./100 ml.	7 – 11	7 – 11
Cobalt	mcg./100 ml.	≦9	≦8*
Copper	mcg./100 ml.	70 – 80	70 – 80
Folic acid	mcg./100 ml.	3 – 16	3 – 11
Inositol	mg./100 ml.	94 –105	107 –143
Iodine	mcg./100 ml.	≦0.3	≦0.1
Iron	mcg./100 ml.	100 –180	78 –120
Magnesium	mg./100 ml.	4.2 – 12	4.7 – 14
Manganese	mcg./100 ml.	NF† – 23	NF† – 19
Niacin	mg./100 ml.	0.22– 0.23	0.22– 0.36
Nitrogen			
Total	mg./100 ml.	105 –140	130 –164
Amino	mg./100 ml.	12.5 – 19.0	11.0 – 24.0
Volatile	mg./100 ml.	≦10.4	≦14.3
Non-volatile	mg./100 ml.	≦100	≦130
Pantothenic acid	mcg./100 ml.	140 –280	160 –310
Para-amino-benzoic acid	mcg./100 ml.	5 – 10	5 – 6
Phosphorus	mg./100 ml.	12 – 15	14 – 18
Potassium	mg./100 ml.	183 –301	197 –251
Pyridoxine	mcg./100 ml.	36 – 45	40 – 64
Riboflavin	mcg./100 ml.	19 – 43	17 – 45
Sulphur, total	mg./100 ml.	5.0 – 8.7	3.8 – 7.6
Thiamine	mcg./100 ml.	96 –110	83 –101
Tocopherols	mg./100 ml.	≦99	≦94
Vitamin K		NF†	NF†

* ≦—not more than.

† NF—not found.

TABLE 2

Ranges of values in individual samples (1951)

COMPONENT	SAMPLES OF EACH JUICE	UNITS	FRESH-FROZEN, RECONSTITUTED ORANGE JUICE		FRESHLY SQUEEZED ORANGE JUICE	
			Range	Mean	Range	Mean
Betaine	5	mg./100 ml.	39 – 63	49	43 – 49	46
Biotin	10	mcg./100 ml.	0.20 – 0.28	0.26	0.10 – 0.39	0.26
Calcium	10	mg./100 ml.	3 – 18	7	4 – 15	10
Choline	5	mg./100 ml.	9 – 16	12	10 – 13	12
Cobalt	10	mcg./100 ml.	24 –100	74	12 – 80	67
Copper	10	mcg./100 ml.	45 –160	83	45 –101	90
Folic acid	10	mcg./100 ml.	1.4 – 2.9	2.2	1.4 – 3.3	2.2
Inositol	10	mg./100 ml.	78 –108	92	98 –130	118
Iodine	5	mcg./100 ml.	0.23 – 0.26	0.24	0.19 – 0.23	0.21
Iron	10	mcg./100 ml.	129 –300	201	119 –350	215
Magnesium	10	mg./100 ml.	2 – 13	6	4 – 16	9
Manganese	10	mcg./100 ml.	17 – 55	33	12 – 28	18
Niacin	10	mg./100 ml.	0.21 – 0.28	0.24	0.20 – 0.30	0.25
Nitrogen						
Total	5	mg./100 ml.	96 –109	104	67 – 94	79
Amino	5	mg./100 ml.	19 – 26	22	19 – 26	22
Volatile	5	mg./100 ml.	8 – 9	8	5 – 8	7
Non-volatile	5	mg./100 ml.	88 –100	96	64 – 86	72
Pantothenic acid	10	mcg./100 ml.	134 –160	146	130 –168	145
Para-aminobenzoic acid	5	mcg./100 ml.	4 – 5	4	4	4
Phosphorus	10	mg./100 ml.	16 – 21	19	15 – 20	18
Potassium	10	mg./100 ml.	300 –530	380	220 –350	290
Pyridoxine	5	mcg./100 ml.	20 – 24	22	24 – 29	26
Riboflavin	10	mcg./100 ml.	11 – 21	18	14 – 20	17
Sulphur, total	5	mg./100 ml.	2.4 – 3.6	3.0	2.7 – 4.6	3.5
Tocopherols	5	mg./100 ml.	94 –126	107	88 –121	104
Vitamin A	5	mcg./100 ml.	16 – 24	19	12 – 19	16
Thiamine	10	mcg./100 ml.	69 –116	87	60 –101	83
Vitamin B_{12}	5	mcg./100 ml.	0.0013– 0.003	0.0022	0.0011– 0.0013	0.0012

TABLE 3

Ascorbic acid content of fresh-frozen orange juice packed during the 1950–1951 season

MONTH	ASCORBIC ACID IN FRESH-FROZEN, RECONSTITUTED ORANGE JUICE
	mg./100 ml.
December	54.1 ± 1.8*
January	54.4 ± 1.6
February	52.3 ± 0.6
March	50.5 ± 1.5
April	45.1 ± 2.6
May	39.0 ± 2.1
June	36.9 ± 1.1
July	34.7 ± 1.3
Weighted average†	46.4

* Standard deviation.

† Weighted for actual monthly production variations of one large producer.

juice was higher than that in fresh-frozen juice. Phosphorus and total sulphur were present in approximately the same amount in both types of juices.

Table 3 shows the ascorbic acid content of reconstituted fresh-frozen orange juice during the portion of year in which it is packed.

The following amino acids were identified in both freshly squeezed and reconstituted fresh-frozen orange juice:

Before hydrolysis: Aspartic acid, glutamic acid, serine, asparagine, alanine, gamma aminobutyric acid, and proline were present in the greatest quantities. Valine, arginine, and lysine were present in lesser amounts, while the leucines and threonine were present in traces. Hydroxyproline was not present. Glycine, if present, was masked by the relatively large amount of asparagine.

After hydrolysis with 6 N hydrochloric acid, the same amino acids were found except that asparagine disappeared. There was a great increase in the amount of aspartic acid (from asparagine), and noticeable increases in arginine, lysine, the leucines, valine, and serine. Glycine, phenylalanine, and tyrosine were present after hydrolysis.

In connection with this investigation, it is of interest that Rockland *et al.* (21) have identified the following constituents in the juice of California

and Washington oranges: alanine, asparagine, arginine, glutamic acid (?), lysine (?), proline, and serine. With regard to glutamine, it appears likely that any glutamine present in the juice would have been converted to glutamic acid during our experimental procedure.

SUMMARY

Various constituents of fresh-frozen reconstituted orange juice were compared with those found in freshly squeezed orange juice when ten separate samples of each were assayed.

The following constituents were found to be present in approximately the same concentrations in both fresh-frozen and freshly squeezed juice: thiamine, riboflavin, para-aminobenzoic acid, niacin, choline, biotin, phosphorus, magnesium, and total sulphur. Values for calcium, pyridoxine, and inositol appeared to be higher in freshly squeezed juice than in fresh-frozen juice. The data obtained suggests that the mean values for iodine, manganese, potassium, vitamin A, and vitamin B_{12} were higher in the fresh-frozen than the freshly squeezed juice.

The following free amino acids were found in both types of orange juice: aspartic acid, glutamic acid, serine, asparagine, alanine, gamma aminobutyric acid, proline, valine, arginine, and lysine. Traces of the leucines and threonine were also found.

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Small Kansas Colleges Offer Degree in Dietetics

In order to encourage girls attending small Kansas colleges to major in dietetics, the Kansas Dietetic Association has made a study of the curricula in seven of the state's smaller colleges. Ruth Gordon and Virginia Toews, both of the University of Kansas Medical Center, evaluated the curricula and found out that in all the colleges, the addition of only two or three courses would complete the academic requirements for membership in The American Dietetic Association.

The courses usually missing in the small-college curriculum are: diet and disease, organization and management, and sometimes quantity cookery. In most instances, students could take these courses in summer school at other colleges between their junior and senior years or after graduation.

This simple expedient can prevent the loss of prospective dietitians to other fields by allowing them to avoid the alternatives of changing their major or transferring to another college. Going to another college is often more expensive than attending one nearer home, and in addition, is often not approved by parents.

Role of Breakfast and of Between-Meal Foods in Adolescents' Nutrient Intake[1]

BETTY F. STEELE, Ph.D.,[2] MARY M. CLAYTON, Ph.D.,[3] and RUTH E. TUCKER, Ph.D.[4]

DURING the last few years much research has been done on the physiologic effects of omitting breakfast and of breakfasts containing various amounts and kinds of nutrients (1–4). The general conclusion from these studies seems to be that people feel better and work better after a breakfast containing one-fourth to one-third of their total day's calories and that the type and amount of protein consumed at breakfast is important. The home diet of grade school children was studied in 1938–39 by Lowther *et al.* (5). They found that breakfast was lower than the other meals in calories, protein, phosphorus, iron, vitamin A, thiamine, and ascorbic acid. The Rochester Child Health Project indicated from a survey that they found many children not eating adequate breakfasts (6). Todhunter has reported that one-seventh of the children studied in Alabama missed breakfast at least once a week (7).

It has been shown by various workers that an inverse relationship exists between age and adequacy of nutrient intake (8–10). Thus during the time the adolescent has an increased need for nutrients, he may actually decrease the adequacy of his intake. Because of the nutritional importance of breakfast, the present study was undertaken to determine the contribution of breakfast to the total daily nutrient intake of adolescents. The contribution of between-meal foods was also studied to see to what extent this supplementary intake improved the over-all adequacy of the children's diets.

METHODS

Subjects. Three hundred and sixteen children (181 girls, 135 boys) of junior and senior high school age participated in this study which was conducted by three state experiment stations in the Northeastern region. In Maine, 27 girls and 30 boys of junior high school age were chosen at random from the group of 780 children who took part in the Regional Project. In Central New York, dietary records were kept by 81 girls and 67 boys, ranging in age from eleven to nineteen years, who were chosen from seventh and eighth grade pupils in two schools. Rhode Island's subjects were high school students, 73 girls and 38 boys, ranging in age from fourteen to twenty years.

Dietary Records. A seven-day record of food intake for each subject was kept in a special booklet which carried on its cover spaces for the name, the school, and the dates covered. Printed instructions for the recording of the food eaten were also placed on the cover. The inside pages of the booklet had spaces for the date, time, place of eating, description of the food, and the amount eaten. Only skeleton headings were used to avoid suggesting intake to the subjects. More complete details of the booklets and instructions are given elsewhere (10, 11).

Criteria for Grouping Subjects. If the child had any food, even coffee plus sugar or cream, which contributed calories and was consumed before going to school or immediately after rising on non-school days, he was considered to have had breakfast. If the child missed one breakfast during the seven-day period, he was classified in the "missed" breakfast group.

If the child ate between meals once during the seven-day period, he was considered with the group having between-meal food.

Calculation of Nutritive Values and of Percentage Contribution. The dietaries were calculated for calories, protein, calcium, phosphorus, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid by the Babcock method (12). The percentage contribution

[1] This paper is a contribution from the Northeastern Regional Nutritional Status Project NE-4 which was supported in part by regional research funds from the Research and Marketing Act of 1946 and in part by other federal and state funds. Received for publication June 16, 1952.

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of breakfast and of between-meal foods to the total daily intake and to the Recommended Dietary Allowances (13) was computed by determining the percentage values for each individual subject and the mean for these values.

A comparison of adequacy was made between the diets of children who always ate breakfast and those who missed breakfast at least once a week. The effect of between-meal food on dietary adequacy was also determined.

RESULTS AND DISCUSSION

Of the boys, 88 per cent from New York, 87 per cent from Rhode Island, and 97 per cent from Maine ate breakfast every day. Smaller percentages of girls in each state ate breakfast regularly: 86 per cent in New York, 80 per cent in Rhode Island, and 96 per cent in Maine. The breakfasts contributed an average of approximately 20 per cent to the total daily nutrient intake and to the recommended allowances for these children (Table 1). Values ranged from 13 per cent of the daily intake of niacin (New York girls) to 36 per cent of ascorbic acid (Rhode Island girls). It is surprising that only 36 per cent or less of the daily intake of ascorbic acid was supplied by the breakfast. The breakfasts of these adolescent subjects were quite similar in their contribution of nutrients to the daily intake. The average breakfast of the boys contributed more to their daily intake and to their ability to meet the recommended allowances than did the breakfasts of the girls.

Recent work seems to show that responses to physiologic tests are better when one has a breakfast containing one-fourth to one-third of the total day's calories; the type and amount of protein received is also important. The percentages of children who ate less than one-fourth of their total daily intake of different nutrients in their breakfast is given in Table 2. This picture is of interest to any nutritionist when she sees the high percentage of the children included in this category. Ninety-five per cent of the Rhode Island girls received less than one-fourth of their daily protein intake at breakfast. On the average, the girls tended to eat less adequate breakfasts than the boys, and the Rhode Island high school students

TABLE 1

Average contribution of breakfast and between-meal foods to the Recommended Dietary Allowances and to the daily nutrient intake of adolescent children from Maine, New York, and Rhode Island

NUTRIENTS	BOYS						GIRLS					
	Maine		New York		Rhode Island		Maine		New York		Rhode Island	
	Recommended allowance	Daily intake	Recommended allowance	Daily intake	Recommended allowance	Daily intake	Recommended allowance	Daily intake	Recommended allowance	Daily intake	Recommended allowance	Daily intake
	Breakfast*											
	%	%	%	%	%	%	%	%	%	%	%	%
Calories	20	24	19	23	15	19	19	21	17	20	15	17
Protein	24	24	22	22	18	18	20	22	18	20	15	16
Calcium	25	30	26	29	22	25	25	30	23	27	18	22
Phosphorus	32	28	20	26	25	22	28	25	16	24	16	19
Iron	23	21	21	21	19	18	17	19	15	18	14	18
Vitamin A	21	17	20	17	18	18	17	16	17	15	14	14
Thiamine	29	28	26	25	23	23	25	25	21	23	21	22
Riboflavin	32	29	30	27	23	23	28	28	25	25	19	21
Niacin	19	20	16	16	14	14	15	16	13	15	12	13
Ascorbic acid	28	29	22	29	27	27	29	34	27	34	35	36
	Between-Meal Foods†											
Calories	10	11	8	10	13	15	10	11	9	11	16	19
Protein	7	7	7	7	10	10	7	7	6	6	11	13
Calcium	7	7	7	8	14	15	6	7	5	6	12	16
Phosphorus	8	6	5	7	14	12	8	7	4	6	11	14
Iron	7	7	7	7	9	9	6	7	6	7	10	14
Vitamin A	7	5	8	7	7	7	5	5	5	5	11	11
Thiamine	6	6	6	6	9	9	6	6	5	5	12	13
Riboflavin	8	7	8	7	13	13	7	6	6	7	12	15
Niacin	10	9	9	9	8	8	12	10	7	8	13	14
Ascorbic acid	4	4	3	5	7	9	3	4	4	5	9	11

* Subjects: Maine—30 boys, 27 girls; New York—59 boys, 70 girls; Rhode Island—33 boys, 58 girls.

† Subjects: Maine—30 boys, 27 girls; New York—63 boys, 72 girls; Rhode Island—35 boys, 72 girls.

fared worse than did the junior high school students in Maine and New York. Fifty per cent or more of the children received less than one-fourth of their daily intakes of calories, protein, iron, thiamine (except Maine boys), vitamin A, and niacin at breakfast. Such a pattern could indicate a low consumption of cereal, although in general this was not true for Maine boys (14). Ascorbic acid, riboflavin, and calcium were the nutrients supplied most abundantly by the breakfasts of the Maine and New York children. However, Clayton (14) has shown that 37 per cent of the Maine boys and 41 per cent of the girls received less than 15 per cent of the recommended allowance for ascorbic acid in their breakfasts. The breakfasts of the Rhode Island boys and girls were generally low in nutrient content.

Thus while the daily dietaries of the children were not critically low when evaluated in terms of recommended allowances (Table 3), the breakfasts usually contributed low amounts of nutrients to the daily intake. This was especially true for calories. Recent work by Daum and co-workers has emphasized the physiologic importance of adequate calories at breakfast (1–3). These children's breakfasts were also low in protein, a nutrient that is important in maintaining blood sugar levels between periods of eating (15).

In Table 3, it can be seen that those children who always ate breakfast more nearly met the recommended allowances than those who did not. The most important differences in nutrient intake between the two groups were in ascorbic acid, calories (New York boys and girls), and calcium and phosphorus (New York girls). From these data, it would appear that the other meals do not overcome deficiencies in these nutrients caused by missing breakfast.

TABLE 2

Percentage of children who received less than one-fourth of their day's intake of different nutrients in their breakfast

NUTRIENT	MAINE		NEW YORK		RHODE ISLAND	
	Boys	Girls	Boys	Girls	Boys	Girls
	%	%	%	%	%	%
Calories	67	85	73	83	82	93
Protein	63	70	71	81	79	95
Calcium	30	15	33	44	55	60
Phosphorus	43	56	49	60	67	71
Iron	80	85	68	90	88	84
Vitamin A	90	82	63	74	73	91
Thiamine	30	52	54	73	61	64
Riboflavin	33	30	44	46	58	69
Niacin	77	93	91	96	94	95
Ascorbic acid	43	37	49	37	51	26

CONTRIBUTION OF SNACKS

The diets of the children were examined to see what contribution any between-meal foods made to the over-all adequacy of the diet. The results of the tabulations expressed in contribution to the daily intake and to the recommended allowances are given in Table 1. All of the Maine children; 88 per cent of the boys and 86 per cent of the girls from New York; and 92 per cent of the boys and 98 per cent of the girls from Rhode Island ate between meals. It would seem that these supplementary foods contributed predominantly to caloric intake in Maine and New York. It is interesting to note the low contribution to ascorbic acid intake; citrus fruits are evidently not popular as a supplementary food. In Maine and in New York, between-meal foods contributed 10 per cent or less to the daily nutrient intake and to the recommended allowances except for calories and niacin (Maine). In Rhode Island, snacks

TABLE 3

Comparison of total daily nutrient intake in terms of Recommended Dietary Allowances for adolescents eating and omitting breakfast

NUTRIENTS	PERCENTAGE OF RECOMMENDED ALLOWANCE RECEIVED DAILY							
	New York				Rhode Island			
	Boys		Girls		Boys		Girls	
	Ate breakfast*	Missed breakfast†	Ate breakfast*	Missed breakfast†	Ate breakfast*	Missed breakfast†	Ate breakfast*	Missed breakfast†
Calories	82	65	85	65	81	77	87	75
Protein	100	81	91	70	101	83	89	75
Calcium	88	71	84	52	98	72	80	68
Phosphorus	76	60	73	50	117	96	84	70
Iron	95	75	78	71	107	96	78	66
Vitamin A	117	85	109	62	114	102	117	78
Thiamine	99	74	92	70	100	83	95	78
Riboflavin	109	92	99	60	103	74	86	72
Niacin	96	82	91	76	102	97	97	86
Ascorbic acid	73	47	77	45	84	53	86	77

* Subjects: New York—59 boys, 70 girls; Rhode Island—33 boys, 58 girls.

† Subjects: New York—8 boys, 11 girls; Rhode Island—5 boys, 15 girls.

played a role, furnishing an appreciable proportion of the intake of calories, protein, calcium, phosphorus, and riboflavin for both the boys and girls. At least 11 per cent and usually more of the daily nutrient intake was contributed by the between-meal foods.

SUMMARY

Seven-day dietary records for 181 adolescent girls and 135 adolescent boys from Maine, New York, and Rhode Island were studied to determine the contributions of breakfast and between-meal foods to the children's daily nutrient intake and to the daily allowances recommended by the National Research Council.

Breakfast contributed approximately one-fifth of the daily nutrient intake and of the recommended allowances for both boys and girls in all three states. Fifty per cent or more of the children received less than one-fourth of their daily intakes of calories and of protein at breakfast. Boys and girls who always had breakfast more nearly met the recommended allowances for their age groups than those who missed breakfast once a week or more.

Between-meal foods contributed 10 per cent or less to the daily nutrient intake and to the recommended allowances for the junior high school children from Maine and New York, but were much more important to the high school children of Rhode Island and made substantial contributions to their intakes of calories, protein, calcium, and phosphorus.

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Dietary Allowances Studied

Dr. Grace Goldsmith, Chairman, Committee on Dietary Allowances of the Food and Nutrition Board, reported at its meeting on April 24 that the committee considered the present status of the recommended allowances and also considered some of the newer nutrients. It was the consensus of the committee that the amount of new information made available since the last publication justified the undertaking of a revision of the bulletin. This does not mean that the committee contemplates any drastic changes, but there is a wealth of material which should be included in validating the present recommendations and making some minor changes.

The fact that the table of Recommended Dietary Allowances has been widely reprinted without the explanatory matter contained in the full bulletin has led to some misunderstanding of the basic philosophy of the recommendations as a goal for a good state of nutrition rather than a barely adequate one. To correct this, a few sentences could be added to the footnotes to the table which would emphasize that philosophy.

Other recommendations for the revised bulletin were: (a) no immediate change in the allowances for specific nutrients as given in the present table; (b) a definite statement concerning the essentiality of vitamin B_6 or pyridoxine; (c) further consideration of folic acid, with the aim of possibly giving an estimate of what might be a desirable level for that nutrient; (d) appointment of a subcommittee of the Committee on Dietary Allowances, to study the status of pantothenic acid and report at the next committee meeting. There did not appear to be sufficient information available concerning choline to justify a recommendation.

As Chairman of the Subcommittee on Calcium, Dr. Margaret A. Ohlson reported that the committee was not prepared to make specific recommendations concerning the calcium allowance, but that the problem was beginning to emerge.—*From Proc. Food and Nutrition Board 12: 9 (May), 1952.*

BEULAH A. HUNZICKER

President, The American Dietetic Association

Editorial

BEULAH A. HUNZICKER

President, The American Dietetic Association

Beulah A. Hunzicker, the new President of The American Dietetic Association, brings to the presidency an intelligence mixed with warmth and charm as well as a background of professional experience that well qualifies her to carry on the trust the members have placed in her.

She was born in a small town in southern Wisconsin and has always held a strong affection for the small town. She was the "big sister" of five younger brothers, and it was undoubtedly this early experience and training that started her on an administrative career.

After completing her elementary and high school training in the Lake Mills schools, she entered the University of Wisconsin, from which she received her Bachelor of Science degree. It was at the University that her interest in foods and nutrition began, and this led her into dietetics as a profession. She entered the dietetic internship at the University Hospital, Ann Arbor, Michigan, and on completion of this course, accepted a position in the Memorial Hospital, Fremont, Ohio. The desire for further training led her back to Madison, where she completed her work for a Master of Science degree. Even though responsibilities have been heavy and time limited, Miss Hunzicker has always found the time to study and keep abreast of new developments.

In 1929, she accepted a position as Assistant Dietitian at Presbyterian Hospital, Chicago, where she now is. In the interim, one year was spent at the University Hospital, Ann Arbor, where she was on the staff, but she left when she was called back to take over the position of Director of Dietetics at Presbyterian Hospital.

Her interest in teaching has been characteristic of her enthusiasm. Since 1947, Miss Hunzicker has lectured at Northwestern University to the students in the hospital administrative course.

Her career has been a work of love and service for those with whom she has been associated. She has taken an active part in the development of the Chicago Dietetic Association and the Illinois Dietetic Association, as well as serving as Treasurer and Vice-President of The American Dietetic Association.

With the interest, enthusiasm, and professional ideals of Miss Hunzicker, The American Dietetic Association can look forward to a year of achievement with her as President.—*Lida A. Jamison, Vice-President, The Chicago Dietetic Supply House.*

LYDIA J. ROBERTS ESSAY AWARD

In 1951, the Gerber Products Company made a grant to The American Dietetic Association offering a $500 annual prize for five years for the best essay on a subject in the field of the history of nutrition. This award was named for Lydia J. Roberts in honor of her outstanding contributions to nutrition of children. Topics for the next four years' contests are to be follows:

1953—Child Feeding in the United States in the Nineteenth Century

1954—The History of Artificial Feeding of Infants

1955—Nineteenth Century Leaders in Infant Feeding

1956—The History of Nutrition Education Programs for Children in the United States

RULES GOVERNING THE AWARD

The rules governing the Award are as follows:

1. The Award shall be open to: any graduate student of nutrition in an accredited university; dietetic intern in an internship approved by The American Dietetic Association; or member of the Association.

2. Essays shall be typed in triplicate, double spaced, and shall not be less than 15 or more than 20 pages in length, exclusive of references.

3. Essays accompanied by separate vita of contestant shall be received by the Executive Secretary on or before June 1 of each year, except for 1953 when the closing date will be May 1.

4. All essays shall become the property of The American Dietetic Association, with publication rights in the JOURNAL or elsewhere as the Association deems advisable.

5. Essays shall be judged by a committee of three persons, to be appointed by the Executive Board of The American Dietetic Association. The names of the judges shall not be made public.

6. Essays shall be judged on the basis of original investigation and interpretation of source material; coverage of subject and final conclusion; and on organization, literary style, and documentation.

7. The decision of the judges shall be final. No award shall be made in any year that the judges consider no essay merits an award.

8. The Award shall be presented at the Annual Meeting of The American Dietetic Association or other occasion designated by the Executive Board.

Current Comment

NUTRITION CLINIC FOR GARMENT WORKERS

BETSY HELBURN

Nutritionist, Nutrition Clinic, Union Health Center, New York City

In a study of the nutritional status of industrial workers, sponsored by the Milbank Memorial Fund and published in 1944, Wiehl (1) wrote as follows: "Studies of human beings on the role of malnutrition in disease, ill health, efficiency, work output, etc., are difficult and time consuming. The need for them is great and undoubtedly their number will increase. Present knowledge, however, affords an adequate basis for acceptance of the premise that a well nourished employee is a better industrial risk than one in a subnormal nutritional state."

The soundness of this premise has been demonstrated by the experience at the Union Health Center. The Nutrition Clinic was established because the Director of the Center, Dr. Leo Price, felt its need. He realized that the doctors were too busy to be able to give their patients adequate information and instruction concerning nutrition. He had long admired the work done by the Food Clinic at the Boston Dispensary, which served as a model in the establishment of our Nutrition Clinic.

The Union Health Center is operated by the International Ladies' Garment Workers Union for its 200,000 members in New York City. It provides ambulatory medical care of the highest standard, emphasizing the services most important to the maintenance of the health of the workers. It provides this service at times which do not interfere with the patient's working hours.

In 1947, the Union Health Center established the Nutrition Clinic; that year, it handled 1239 appointments; in 1951, it took care of 7523 appointments.

THE UNION HEALTH CENTER

In 1913 when the Health Center of the International Ladies' Garment Workers Union was established, it occupied one room and enjoyed the services of one part-time doctor. Today the medical staff includes some one hundred and fifty doctors, full- or part-time, and the institution occupies six floors of its own modern office building in New York City. The location is in mid-Manhattan, at the edge of the garment district.

The services provided at the Center, including those of the Nutrition Clinic, are not free. They are paid for by the union members. A yearly book of stamps, redeemable at the Center for medical service, is issued to each union member. The fees at the Nutrition Clinic are $2.50 for three visits and 75 cents for each subsequent visit.

The Center and the Nutrition Clinic serve people who are not usually reached by nutrition education. They are working people and either do not belong to, or do not have the time and energy to attend meetings of community groups. Sometimes, too, language difficulties or cultural differences make them hesitant about such participation. The Nutrition Clinic is conveniently available to them, almost as a part of their daily work routine. Their language difficulties are surmounted, and cultural differences do not matter.

The great majority of the patients of the Health Center are in the older age groups. In fact, the Center serves only members and their adult dependents. No pediatric service is offered. Fifty-nine per cent of the Center's patients are over fifty years of age, and 81 per cent are over forty. For this reason, the treatment of chronic diseases, such as diabetes, arthritis, and cardiac conditions, which make a great number "working invalids," necessarily receives special attention. Many of our patients must have not only good medical care, but must be given guidance and advice in solving the problem of conserving their health. This means education, which is as important in the scheme of the Center as a whole as medical treatment itself.

It must be stressed that, in line with the Center's policy, the Nutrition Clinic's primary job is practical rather than theoretical. It is in no sense of the word a "research institute." On the contrary, it is a thoroughly practical and down-to-earth organization, devoting its skill and effort to a highly important educational job. Its program is designed to serve the best health interests of the organized workers in the garment industry. Its basic and primary interest is the presentation of scientifically correct and practical dietary information to patients, so that they may be sympathetically and efficiently aided in making whatever adjustments are possible for the achievement and maintenance of good health.

THE NUTRITION CLINIC

Patients reach the Nutrition Clinic only by referral from the medical staff of the Union Health Center, and the referrals are made on the basis of specific problems only, i.e., weight, diabetes, cardiac conditions, and other problems.

The Nutrition Clinic is open from 9 A.M. to 7

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PUMPKIN PIE *(for 50)*

INGREDIENTS	AMOUNTS OR WEIGHTS
Light brown sugar, lightly packed	3 pounds
Flour	½ cup (2 oz.)
Salt	4 teaspoons
Cinnamon, ground	2½ tablespoons
Nutmeg, ground	4 teaspoons
Ginger, ground	4 teaspoons
Cloves, ground	2 teaspoons
Freshly cooked or canned pumpkin	3 quarts
Pet Milk	5 tall cans
Eggs, slightly beaten	8
Dark cooking molasses	1 cup (12 oz.)

DIRECTIONS

Turn on oven and set at very hot (450). Mix sugar, flour, salt, cinnamon, nutmeg, ginger and cloves. Add pumpkin, milk, beaten eggs and molasses. Stir until smooth. Pour into pie pans lined with unbaked pastry. Bake 15 minutes, then reduce heat to slow (325), and bake about 40 minutes, or until firm. Makes ten 8-inch pies; eight 9-inch pies or seven 10-inch pies. Serves 50.

NOTE: 6 tablespoons packaged pumpkin pie spice may be substituted for the cinnamon, nutmeg, ginger and cloves.

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The Nutrition Clinic was started with one nutritionist, who handled all the work until 1950. With increasing need, another nutritionist was then added to the staff, and now, two years later, expansion of service dictates more personnel. The doctors of the Center have requested that a nutritionist be available on the floors to cover medical and special clinics. Two nutritionists are needed in the Cardiac Clinic, where at present three to four doctors and one nutritionist handle from twenty-five to thirty patients in a 3-hr. clinic session.

The objective of the Nutrition Clinic is to help patients adjust their daily food pattern or habits to conform to accepted standards of good nutrition. The Clinic does not confine its services to those who are on therapeutic diets. Those eating normal diets may also receive advice and guidance. The information is given in terms that the patient can understand, and every effort is made to make special diets dovetail with the patient's own food habits.

TECHNIQUES IN HANDLING PATIENTS

Three procedures for meeting patients are used. There is the initial visit, which is always a private interview and may last from three-quarters of an hour to an hour and a half. To the uninitiated, this may seem too great an expenditure of time. However, it is the sincere belief of the Clinic staff that only in this way is an interview sufficiently thorough to obtain all necessary information concerning the psychosocioeconomic background of the patient. After the first visit, a patient returns at frequent, scheduled intervals for check-ups. The follow-up visits may take the form either of individual interviews or group discussion meetings. If interviews are felt to be necessary, they may last from 10 to 30 min. In all instances, of course, it is our policy to treat each patient not merely as an ulcer problem or a diabetic problem, but as an individual.

The duties of the Nutrition Clinic staff do not end with seeing patients individually and in groups. In certain clinics, a nutritionist is in attendance so that the patient may receive dietary instruction during his visit with the doctor. In this way, not only is the patient enabled to acquire a better understanding of the importance of his diet in the treatment of his ailment, but the physician is relieved of discussion of this phase and thus may devote himself entirely to the medical aspects of the problem. This also permits the nutrition staff to serve more patients. This plan has been carried out with marked success in the Diabetic, Cardiac, and Gastrointestinal Clinics. In 1951, more than 2500 diabetic patients were referred to the Nutrition Clinic.

We try to make our procedure simple, and our instructions and suggestions are given in terms that are readily understandable. All questions asked by the patients are answered with completeness and clarity, and all instructions are phrased in terms fully within their grasp. If a prescribed diet is to achieve its ultimate value, the patient must understand the reasons for it, how to accomplish it, and the results that may be expected from it. His gaining this essential degree of understanding depends largely on the interest and sympathy shown by the nutritionist. Thus it often happens that the nutritionist must spend three-quarters of the time with the patient trying to eliminate wrong food ideas or to abolish fancy or dangerous dietary "fads." In the philosophy of the Nutrition Clinic, this is the first and perhaps most important job. Only after it has been accomplished is it possible to start the patient on a correct food pattern.

The work of the Nutrition Clinic is thus essentially educational. Visual aids are often used to impart information. Frequently a wax model or a picture, a well designed and attractively executed chart, or a well planned demonstration will drive the point home where words fail.

The most satisfactory technique we have found for obtaining essential information in the dietary interview is the recall or dietary history method. The nutrition history obtained during the patient's first interview becomes a permanent part of his medical chart, so that the physician may have this information available for correlation with the medical, chemical, and clinical examinations and therapeutic tests. The prescribed diet is worked out on the basis of this information. The original copy of the diet is given to the patient, and a duplicate is filed in the Nutrition Clinic.

We allow each patient all the leeway that is compatible with good medical and nutritional principles. For example, we are aware that most of our patients customarily eat a light lunch and a heavier meal in the evening; whenever possible, we take this into account in developing a special diet.

It is interesting to note that the findings of the Nutrition Clinic indicate that the major nutritional problems of workers in the garment industry are the lack of water, milk, fresh vegetables, and citrus fruits. There is also a considerable tendency to slight breakfast. As a consequence, calcium, water, vitamins A and D, thiamine, riboflavin, niacin, and ascorbic acid are the nutrients generally stressed in the prescribed diets. The importance of breakfast is also emphasized.

Naturally, a special diet is, and must necessarily be, a limited diet. But we believe that the nutritionist

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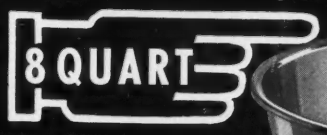

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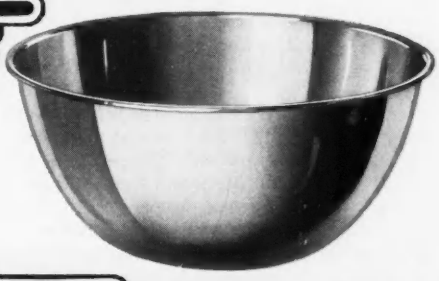

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will obtain best results if she makes an effort to adapt the diet to the individual, insofar as this can be done, and if she refrains from forcing the individual into the diet. We approach the dietary problem of each patient on the basis of his own individual personality and background. Religious and racial background, always important in influencing food habits and preferences, is taken into consideration, along with the entire psycho-socioeconomic situation of the patient.

There are certain special needs experienced by the patients who are served by the Nutrition Clinic. They are all working people, many of them women who not only work but also carry a full load of family responsibilities. Some of them are compelled by circumstances to eat in restaurants exclusively. This creates problems for those on diabetic, low-sodium, and ulcer diets. Many of them have little understanding of planned meals or how to shop. Some are unfamiliar with many of the most beneficial foods, such as various kinds of vegetables and fruits.

Some of the older patients live alone. Many have lost loved ones in Europe, and some have experienced hunger, which has created a feeling of apprehension over food restrictions. Some of the patients show marked fear of being different, of losing status with the social group if different food habits are acquired.

The fact that we serve only adults takes on added significance when it is realized that the experience of the Nutrition Clinic has been that dietary changes within these age groups can be managed as readily as within lower age groups, provided the nutritionist is able to establish the necessary rapport and motivate the patient.

The experience of the Nutrition Clinic with the "group decision method" for analyzing nutritional problems and changing food habits has been especially encouraging. Members of the family or close friends of the patient are welcomed at these follow-up contacts, and we accept for consideration such pertinent experiences and ideas as these individuals contribute. The Clinic has sometimes seen its nutrition teaching bear fruit in the improvement of the dietary habits of a whole family, or even of an entire neighborhood group.

There is real and lasting satisfaction in helping these people solve their dietary problems and meet their needs. The light in a patient's eyes when he says, "I can walk up the stairs without stopping, and the subway steps don't bother me any more" is a real reward for the time and thought expended.

REFERENCE

(1) WIEHL, D. G.: Recent findings on nutritional status of industrial workers. Milbank Mem. Fund Quart. 22: 367, 1944.

Tips for Supervising Women

Speaking before the Michigan Dietetic Association, C. F. Moran, Supervisor of Executive Development and Salaried Employee Training, Fisher Body Division, General Motors Corporation, Detroit, suggested the following rules for supervisors in getting along with women employees:

(a) Take every opportunity to feed the hungry heart. Every person needs to feel that he is accepted for what he is as a human being, or as psychiatry says, every person needs to be loved.

(b) Feed the hungry ego. Every person has an urge to power and wants to be recognized and have significance as a member of the group.

(c) Seize every chance to feed the hungry mind. We recognize that feeling rather than thought motivates us to do the things we do. If you can create the right feeling, then people will think. To paraphrase a common saying, "The way to a person's mind is through his feelings."

Our aim with every employee is to get the job done and to improve his ability to do the job. To achieve this aim, Mr. Moran suggested these techniques:

(a) Have a friendly contact with every employee, every day. You don't have to talk just about work. Don't make the mistake of missing the good employee and spending all your time with the recalcitrant ones. The good employees need to know that you respect them.

(b) When an employee has a problem—listen! Let him talk it out. He may arrive at a very good decision without your giving too much advice.

(c) Learn how and what to commend. Use commendation only when it is deserved, otherwise you only cheapen your relationships with employees. Commend behavior beyond the call of duty and long continued effort. When you commend, give the individual credit and then relate the person to the group. You want loyalty to the group—not just to you. Commend everything worthy of commendation as soon as it happens.

(d) Learn how to reprimand constructively and pleasantly. Every contact with an employee must be pleasant. One valuable approach to the employee is that the mistake is out of line with his character or potential. In this way you have boosted his ego. Then correct the fault, not the employee. Follow up the correction and insist that the correction is made. It is a good rule never to reprimand anyone in public and don't be personal when correcting the fault.

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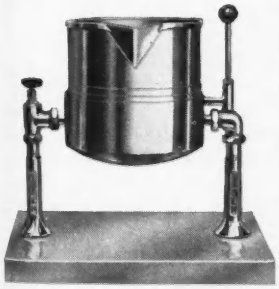

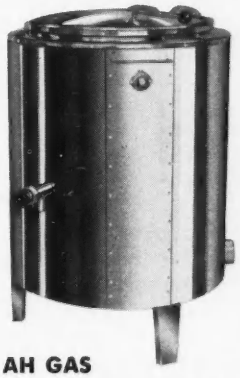

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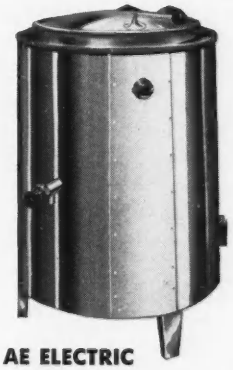

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Recommended Food Handling Procedures for Roast Poultry

BECAUSE stuffing from roast poultry has frequently been incriminated in food poisoning outbreaks, workers in the Test Kitchen and Laboratories of the American Institute of Baking conducted a study to determine best methods of handling and cooking bread stuffings, using 10 to 12 lb. turkeys as the media of study. Both moist and dry type stuffings were tested. The dry stuffing used only melted fat or melted fat and eggs for moisture, while the moist stuffing included melted fat and milk, water, or broth. Included in both types of stuffings were such ingredients as eggs and chopped cooked giblets, since they support bacterial growth and are widely used in most varieties of bread stuffings. Ready-to-cook turkeys, both frozen and fresh, were used.

Results showed that a minimum temperature of 160°F. must be reached in the center of either dry or moist stuffing before the bird is removed from the oven if adequate destruction of the organisms is to be assured. This minimum temperature held true for all stuffed turkeys, regardless of size. A post-oven temperature rise, ranging from 5° to 10°F. within 20 min. provided the most effective lethal temperatures and a margin of safety.

On the basis of their findings, these workers recommend the stuffing of the bird, followed immediately by roasting, as the safest handling method for either type of dressing. They do *not* recommend: stuffing the bird and putting it in the refrigerator overnight before roasting; stuffing the bird, freezing it, and then roasting; or stuffing, roasting, and then freezing it, with reheating prior to service.

The following are other recommendations resulting from this study:

(a) Safe temperature recommendations for bread stuffings can be reduced from 180°F. to 165°F.

(b) The temperature of 165°F. at the center of stuffing must be reached if Streptococci, Salmonellae, and Staphylococci are to be destroyed. This temperature allows a margin of safety.

(c) If thermometers are not used, roasted hot stuffed turkeys should be allowed to rest 20 min. at room temperature before serving to allow for a post-oven temperature rise.

(d) A meat thermometer inserted between the first and second ribs of the turkey should be used.

(e) If thigh temperatures are used as criteria of doneness, present recommendations should be increased from 190°F. to 200°F. to insure doneness of stuffing.

(f) For convenience, the following procedure will save time and produce a safe product: refrigerate cleaned, dressed bird; then prepare stuffing and place in bird just prior to roasting.

(g) Stuffing may be either hot or cold when placed in abdominal cavity if the bird is to be roasted immediately. Hot stuffings should be chilled beforehand if bird is not going to be roasted for several hours.

(h) If stuffed bird is to be refrigerated a few hours, refrigerator temperature should be 38°F. or below for quick chilling.

(i) Stuffing made from mixes require the same minimum safety temperatures as those made from purchased breads.

The following additional precautions are also given:

(a) Roasted stuffed poultry should not be allowed to stand for more than a total of 4 hr. at room temperature either before or after cooking.

(b) Cooked bread stuffings should be removed from the carcass, placed in a covered container, and refrigerated as soon as possible after serving. It is also advisable to remove meat from the carcass and refrigerate it immediately in a covered container.

(c) Do not keep cooked stuffing or poultry more than five days before using.

(d) The texture and consistency of stuffings are decidedly changed when held for one week at 0°F. The stuffing becomes soggy and develops off flavors.

(e) The partial cooking of turkeys and stuffings separately or together, subsequently chilling, and recooking in any manner is not a safe practice.

(f) The freezing of stuffed, uncooked turkeys and stuffed, cooked turkeys is not recommended. In either case, the time lapse required in dropping the temperature at the center of the stuffing takes too long for safety. The time lapse for thawing at room temperatures also increases the possibility of food poisoning.

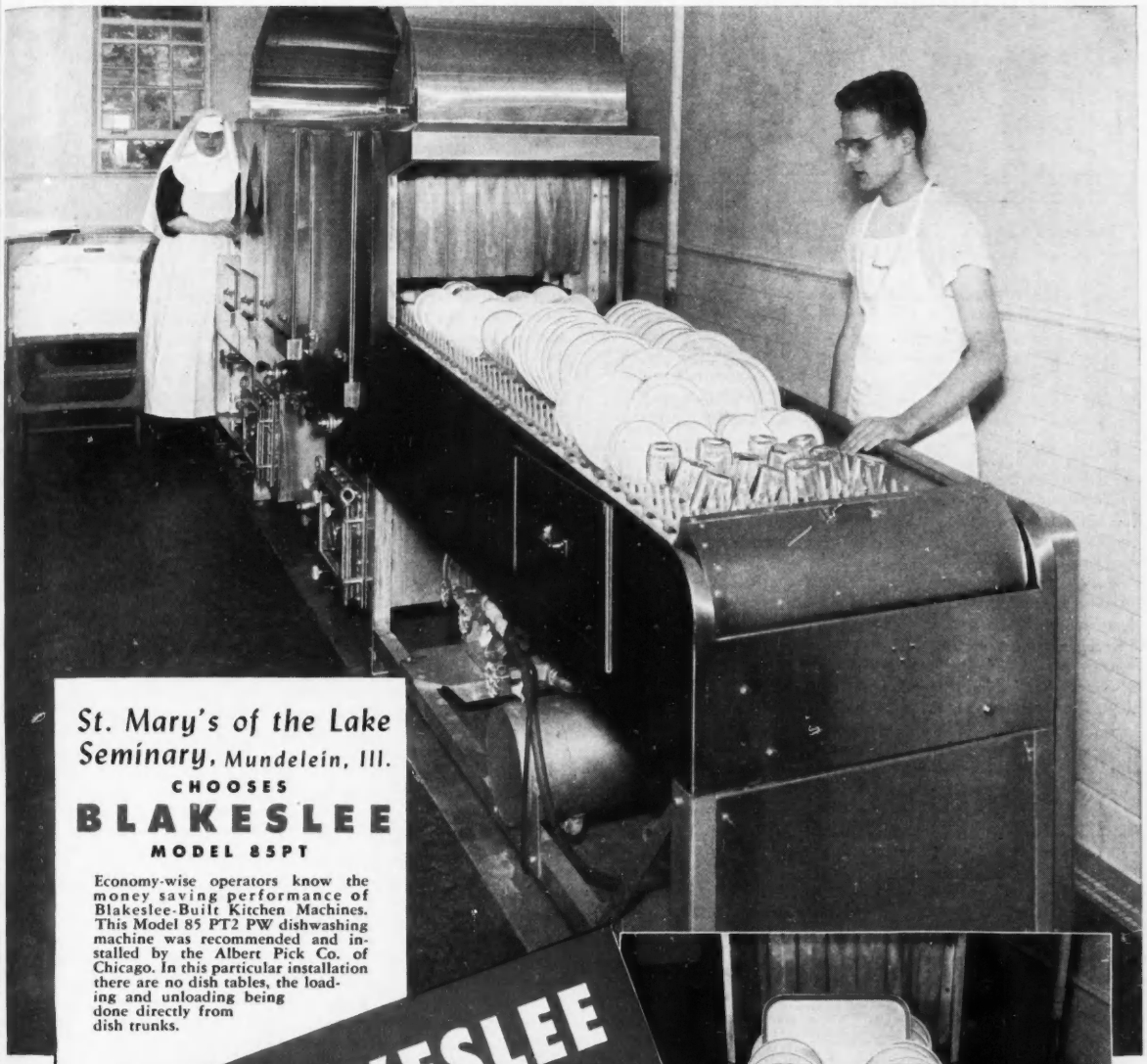
(g) Never thaw and refreeze poultry—stuffed or unstuffed.

The following additional comments of a general nature were also made:

(a) Approximately 1 c. stuffing per pound of ready-to-cook weight was used to fill neck opening and abdominal cavity of the turkeys.

(b) Occasional openings of the oven door for basting purposes did not prolong the roasting time or cause the stuffing to drop in temperature.

(c) Oven temperatures of 325°F. are usually recommended for 10- to 12-lb. birds because the saving in oven time is more important to the average homemaker than the few extra servings which will result from less shrinkage if the bird is cooked at 300°F., the temperature research shows to be ideal.



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Book Reviews

Diabetes Control. By Edward L. Bortz, M.D. Philadelphia: Lea and Febiger, 1951. Cloth. Pp. 264. Price $3.50.

For a disorder that ranks approximately eighth among the causes of death in the United States, the author's stress on the drive for the detection of diabetes seems justifiably emphasized. Dr. Bortz expresses the viewpoint that the condition, when recognized and controlled, need be no handicap, but rather a fascinating challenge to the individual, to his community, and to the medical profession.

The volume presents a thorough discussion and mass of helpful data, including chapters on diabetes detection, control, background information on the nature of diabetes, the diabetic person in industry and national defense, and the psychology of the diabetic person. Many of the chapters are well illustrated.

In keeping with this modern management is the chapter on meal planning. The new carbohydrate values which have been accepted by The American Dietetic Association, the American Diabetes Association, and the U. S. Public Health Service are followed. Included are the six diets suggested by this group, covering a range of calories from 1200 to 2600, meeting the needs of most adults and children. The calculations of the sample diets are given, as well as the exchange lists for milk, vegetables, fruits, bread, meat, and fats. There is also a section on recipes derived from foods permitted on the exchange lists. This method follows the meal pattern of the normal diet as nearly as possible, providing variety in the menu, simplifying menu planning, and incorporating food for the diabetic person with the family menu. In addition, there are suggestions for "eating out" and for seasoning foods. An appendix on the composition and fuel values of alcoholic beverages, to be prescribed when indicated for the alcoholic habits of an individual, has been incorporated.

Dr. Bortz maintains that dietary instruction should never be given until a dietary history is taken. He also states that the fewer the details the patient must master, the more chance there is he will follow his diet. The use of the exchange lists certainly contributes toward the simplification of diets for diabetes and the "dawn of a new day that is at hand for the diabetic."

In his chapter on children, the author lists a number of camps for diabetic children. Suggested diets, a typical menu, and a week's sample menus, as served at the Pennsylvania Camp for Diabetic Children, are included.

The reviewer feels that the suggested low-calorie diets in the chapter on weight control are not sufficiently varied to permit the flexibility desired in adjusting to the individual food habits as previously urged by Dr. Bortz.

For the diabetic individual, the doctor, the dietitian, the student, and all interested and concerned with the care and treatment of the diabetic person, this is a valuable and practical handbook, bringing one up to date on many of the current developments and modern management of diabetes.—*Ida Wides, Director of Food Clinic, Mandel Clinic, Michael Reese Hospital, Chicago.*

Studies of Undernutrition, Wuppertal 1946–49. By Members of the Department of Experimental Medicine, Cambridge, and Associated Workers. Medical Research Council Special Report Series No. 275. London: His Majesty's Stationery Office, 1951. Paper. Pp. 404. Price 12s. 6d. net.

After the fall of Germany, the population of many industrial communities suffered nutritional damage resulting from disruption of normal food supplies. Wuppertal was such a community. Because it had been a prosperous manufacturing center and the bombings which it suffered had not destroyed the hospital facilities, the team of workers from the Cambridge Department of Experimental Medicine were able to command both the subjects and the facilities for precise clinical observations and extensive biochemical and physiologic studies. This volume is a record of their work and represents a major contribution to our knowledge of the effects of suddenly imposed semistarvation on a large population.

The subjects were factory workers, civil internees, repatriated prisoners-of-war from Russian internment camps, civil prisoners, and children from a local child care center. Records of pregnancy, lactation, and the infants born in a local maternity hospital during and immediately following the war were studied. Members of the experimental team served as control subjects.

During the period of observation, the regular ration ranged from 1052 to 1557 calories per man per day, although some extra calories were available to most members of the community because of work assignment, illness, or other special condition. Many households supplemented the regular calorie allotments with food from other sources, but these supplements were uncertain and irregular.

The interest of the experimental group centered about the cause and consequences of hunger edema and the significance of this condition in the many functional and biochemical reactions of the body. However, extensive observations and functional tests were made on many tissues and systems of the body and on the emotional and behavioral reactions. The utilization of certain nutrients in the ration was observed as well as the response to unlimited refeeding.

Of particular value is the interpretative chapter on the history and symptomatology of hunger edema written by Dr. R. A. McCance. This is not a volume for casual reading but a valuable collection of data for reference for any scientist interested in the phenomena of adaptation to a restricted food supply.—*Margaret A. Ohlson, Ph.D., Head, Department of Foods and Nutrition, Michigan State College, East Lansing.*

Instructor's Guide—Sanitary Food Service. By Division of Sanitation, Milk and Food Branch, U. S. Public Health Service. Public Health Service Publication No. 90. Washington: Government Printing Office, 1952. Boards, spiral bound. Pp. 209 + vi. Price $1.50.

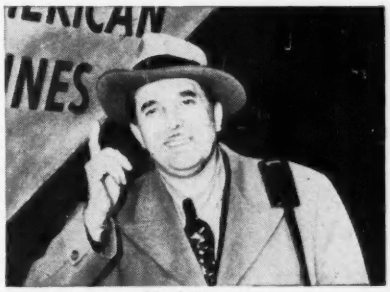
This publication of the U. S. Public Health Service, an *Instructor's Guide* designed for use in training food service personnel in the principles and the application of sanitary food service, is far more than its modest title would indicate.

It was originally conceived and prepared to serve as the basis, with adaptation to individual circumstances, for more uniform food-handling training courses throughout the entire country. To this end, it was planned to provide both subject-matter and teaching suggestions for instructors.

As a first step to universal use, the *Guide* was adopted

Some GAS *cooking facts about the* BISMARCK HOTEL'S *fifty years of fine food*

There's no doubt as to the significant contribution of GAS to the quality of food preparation in the Bismarck's six kitchens. Chef Theodore Meyer's simple statement about the all-GAS Cooking Battery is just part of the story—"*Those are good cooking tools, the best to be had. We cook with GAS, the best fuel for cooking.*"



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The other part of the story of the efficiency, speed, and versatility of the Bismarck's modern Gas Kitchens is just a simple recital of facts about GAS for cooking on large scale or small scale—

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America's leading chefs agree with Chef Meyer that GAS is the best fuel for every kind of cooking, baking, and food service requirement.

Everywhere from coast to coast you can find these important facts about Modern Gas Cooking Equipment. There's a typical installation nearby which your Gas Company Representative can show you—ask him for details.

Three views of the all-GAS kitchen, equipped with 13 hot-top ranges.

4 double-deck roasting ovens, pastry and bake ovens.

3 open-top ranges, 5 broilers, 7 fryers.

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by the Navy and Air Force. Then a traveling team of Public Health Service, Air Force, and Navy personnel last spring presented it in a series of twelve regional meetings to which state and local health authorities, private organizations, Veterans Administration dietitians, and any other interested food service operators were invited. Following this nationwide introduction, the *Guide* was put on sale from the Government Printing Office.

Seldom do we find a textbook with such a wealth of material included. In addition to factual material, properly documented as to original sources, there are detailed outlines for guiding the instructor in presenting it. The many illustrations and the visual aids presented for use in teaching are invaluable.

Sanitation classes for food service employees in the average hospital would probably not take the form of those presented in the manual. Class periods would be much shorter and the amount of material presented at any one time would be less than that included in the hour-long lessons of the *Guide*. However, the *Guide* could serve as a most excellent text and source book for the classes for all types of food service workers in any hospital. There is material for pantry maids, chefs, cooks, waitresses, and every person concerned with food preparation and service.

In large cities where experts or specially trained people are available for courses in sanitation, this textbook could be used by the dietitian or food service manager to supplement material presented at regular intervals in the organized class. In the many communities where the experts are not available for teaching, the guide will prove invaluable to the dietitian or food service worker responsible for the instruction of food service employees. The fact that much more material is incorporated than could be used in any short series of lessons only makes the book more valuable as a source of material for a continuous training program.—*Martha Nelson Lewis, Director, Dietary Department, The Ohio State University Hospital, Columbus.*

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

William Beaumont—November 21, 1785–April 25, 1853

A frontier village in northern Michigan, a fur trading center, a French Canadian voyageur, a gunshot wound under the left breast, and a serious young Army surgeon stationed at Fort Mackinac were "the cast" for one of the great dramas of nutritional history. The first act began June 6, 1822 when Alexis St. Martin received what was believed to be a fatal injury in the chest and abdomen. The story has been told many times.

Under daily treatment by Dr. William Beaumont, the wound partially healed. The physician took him into his own family and continued to care for him. At the end of two years of constant care, St. Martin was able to walk and help himself a little. It was at this time that Beaumont conceived the idea of studying the processes of digestion through the opening into the stomach which remained unclosed.

The first series of four experiments was published in the *Medical Recorder* and dealt with the temperature of the stomach in digestion, movement of the stomach walls, and the relative digestibility of certain foods. In 1833 at Plattsburg, New York, one thousand copies were printed of Beaumont's "Experiments and Observations on the Gastric Juice and the Physiology of Digestion." This report of 238 observations and experiments with fifty-one inferences is today a high-priced collector's item.

Beaumont had no university or college training; he worked with a piece of tubing, magnifying glass, thermometer, scales, and improvised incubator. With this simple equipment and the application of this keen sense of inquiry and acute observation, from one well studied case he laid the foundation for the modern scientific study of gastric function and digestion. Beaumont's experiments were made under many handicaps and discouragements. St. Martin, rather naturally, did not enjoy his part in the program and disappeared three months after the first experiments were well under way; four years passed before he was induced to return. After about eight months he again set off to Canada. A year later he returned for a year, when he once more left for Canada and never again returned.

Of Beaumont much is known through his letters, medical notebooks, and diaries. He was born in Lebanon, Connecticut, the second son of a farmer. At twenty-two, he went to Champlain, New York, where he taught school and studied medical books in the library of Dr. Seth Pomeroy for three years. After two more years in a doctor's office in St. Albans, Vermont, he was appointed in 1812 Assistant Surgeon in the Army stationed at Plattsburg. Active service, private practice in Plattsburg (1816 to 1820), Army surgeon at Fort Mackinac (1820 to 1825), Fort Crawford on the Mississippi, then St. Louis, filled the years to 1839. He then resigned from the Army, continuing in private practice in St. Louis until his death.

Beaumont's portrait shows him as a man of stern, clean-cut features and dark wavy hair. He was patient and kindly in the sickroom, but outspoken and forceful in his language with his colleagues. His achievements came through a natural spirit of inquiry, patience, and persistence in investigation, and careful, logical interpretation of his findings.

REFERENCES: Myer, J. S.: Life and Letters of William Beaumont, Including Hitherto Unpublished Data Concerning the Case of Alexis St. Martin. St. Louis: C. V. Mosby Co., 1912. Rosen, G. S.: The Reception of William Beaumont's Discovery in Europe. New York: Henry Schuman, 1942. William Beaumont's Formative Years; Two Early Notebooks, 1811–1821.—Miller, G., ed. New York: Henry Schuman, 1946.—*Contributed by E. Neige Todhunter, Ph.D., Head, Department of Foods and Nutrition, University of Alabama, Tuscaloosa.*

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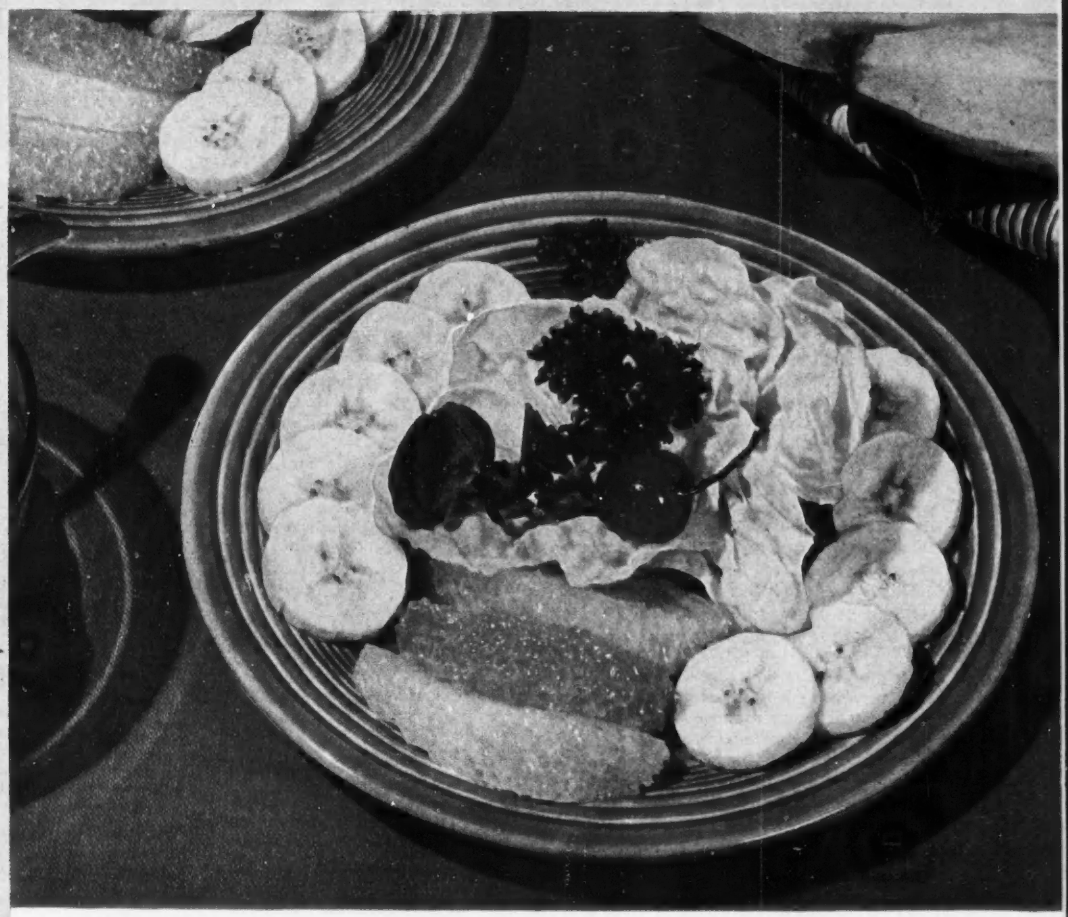
Banana Grapefruit Salad



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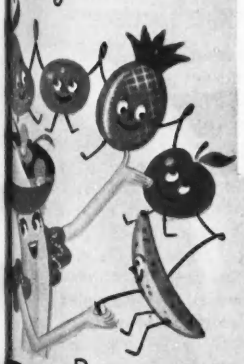
Bananas are sealed by Nature in a germ-proof package.



Bananas combine beautifully with all fruits... fresh, canned or frozen

BANANA GRAPEFRUIT SALAD

(1 large individual serving)

3 grapefruit sections, fresh or canned	Salad greens
1 ripe banana*	Berry or cherry

*Use fully ripe banana . . . yellow peel flecked with brown

Arrange overlapping grapefruit sections along center section of salad plate. Peel banana and slice crosswise into pieces about ¼-inch thick. Arrange 2 rows of overlapping banana slices around sides of plate. Garnish the center with crisp salad greens and berries or cherries, if desired. Serve with sweet or tart dressing.

Important: Pink and white grapefruit sections combined make an especially pretty salad arrangement.

If desired, orange sections may be used in place of, or combined with, the grapefruit sections.

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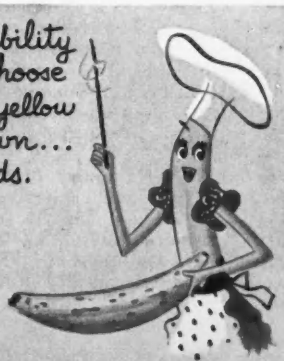
For sweetness, digestibility and peak of flavor choose fully ripe bananas... yellow peel flecked with brown... for salads.



Bananas are a protective food... supplying essential minerals and vitamins A, thiamine (B_1), riboflavin (B_2), ascorbic acid (C) and niacin.

Current Literature

Contributed by Mildred Bonnell and administrative interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Elva Hiscock, Veterans Administration Center, Los Angeles; Pauline Kegereis, The Children's Mercy Hospital, Kansas City, Missouri; Marjorie O'Brien, Franklin Boulevard Community Hospital, Chicago; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 19, July, 1952

* A simple dietary technique for the production of hepatic necrosis with a consideration of the factors preventing the lesion. J. Gillman, C. Gilbert, T. Gillman, and I. Spence.—p. 201.
* Complete restitution of the liver in rats following necrosis and fibrosis of dietary origin. J. Gillman, C. Gilbert, T. Gillman, and I. Spence.—p. 211.

Hepatic Necrosis Produced by Diet. A simple dietary technique for the production of necrosis of the liver in rats is described. The authors stress that the importance of a particular food factor in preventing a pathologic process depends not only on the intrinsic nutritional "needs" of the organism but also on the type of metabolism fostered in the organism by the constituents of the diet.

Restitution of the Liver in Rats. In rats, both acute necrosis and fibrosis of the liver of dietary origin can be followed by complete restitution of structure in an appropriate dietary setting. Necrosis will only be followed by hepatic fibrosis under special dietary circumstances. By manipulation of the diet, a wide diversity of liver pathologies has been produced which are analogous to those seen in malnourished communities.

AMERICAN JOURNAL OF DISEASES OF CHILDREN

Vol. 84, July, 1952

* Intravenous iron therapy in iron-deficiency anemia of infancy and childhood. B. Dickstein, I. J. Wolman, C. Tan, B. Slaughter, and R. Cohen.—p. 52.

Vol. 84, August, 1952

Lack of effect of supplementary vitamin B_{12} administered to premature infants. L. Finberg and B. F. Chow.—p. 165.

Intravenous Iron Therapy. Iron deficiency anemia is more common in infancy and early childhood than is usually recognized. Oral administration of iron salts can almost always treat it effectively, though complete absorption is never reached even when the amount administered is as small as 1 mg. Intravenous injections of saccharated iron oxide are especially effective in cases where surgery must be postponed because of anemia. Formerly weeks and months were needed to build up the blood level by oral administration of iron, while injections of saccharated iron oxide make surgery possible within one or two weeks. These injections are simpler to administer than blood transfusions, and they are more effective when the parents' cooperation is not reliable in giving iron orally. Also, they provide the necessary iron when oral administration causes vomiting or has been rejected for other reasons.

THE AMERICAN JOURNAL OF NURSING

Vol. 52, September, 1952

* All-paper service for food. A. L. Laird.—p. 1119.

All-Paper Food Service. Streamlined techniques in the isolation units at Illinois Research and Educational Hospitals now include the exclusive use of paper containers in the food service. The psychologic effect of "discrimination" against the patient with contagious disease is lessened by using attractively designed, nonabsorbent utensils. Except for the paper containers, trays are identical with those used in other parts of the hospitals. Cross-infection is not the only problem which the paper food service helps prevent: the sterilization process necessary for china and glass involves a wear and tear causing a loss in utensils which is eliminated with paper service. Also, kitchen personnel had feared for their personal health and safety when washing and handling the china and glass. Paper, says the author, is being used more and more in the care of tuberculous patients. She cites as an example a 1240-bed tuberculosis sanitarium where patients drink from nothing but paper cups.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 42, August, 1952

* Food habits of Maine school children. M. M. Clayton.—p. 967.
* Relationship between federal, state, and local food sanitation programs. C. L. Senn.—p. 974.
* Quackery in the field of nutrition. Editorial.—p. 997.

Children's Food Habits. Physical examinations of Maine school children revealed that several types of defects, probably related to nutrition, were quite common. In relation to this finding, food records were kept which indicated that diets tended to be low in citrus fruits and juices, raw and green vegetables, and in milk and milk products. Findings were applied to a reevaluation of school lunch programs in which special attention was given to the inclusion of the deficient nutrients.

Food Sanitation Programs. The nutritionist and bacteriologist should be consulted for answers to many of the questions confronting health departments. Questions of nutrition, chemical adulterants, quality of ingredients, and labeling standards have often not been adequately considered in sanitation programs. Although there is much to be done in developing nationally accepted standards, progress in this direction is encouraging. More improvements will be forthcoming when local health leaders insist on adequate standards and receive help in determining which ones should be enforced. The picture calls for nation-wide teamwork between local, state, and national agencies and the affected industries.

Quackery in Nutrition. Attention is being called in the public health field to the need for continued education of the public in regard to the falsity, and even danger, in the extravagant claims of food faddists. Even though some fads may be nutritionally harmless, they require a needless expenditure of time and money, and legal control cannot be extended to protect the consumer in these respects.

ANNALS OF INTERNAL MEDICINE

Vol. 37, August, 1952

* Role of sodium in the formation and control of ascites in patients with cirrhosis. W. J. Eisenmenger.—p. 261.
* Recent advances in the pathogenesis and treatment of atherosclerosis. G. E. Wakerlin.—p. 313.

Sodium and Ascites in Patients with Cirrhosis. In Laennec's cirrhosis, all of the sodium ingested in excess of dermal and fecal loss is deposited as ascites instead of being excreted in the urine. As a result, there is a virtual absence of sodium from the urine despite a normal intake. In twenty-three patients with advanced cirrhosis, the ascites was adequately controlled in all but three with a diet restricted in sodium to approximately 17 mEq. a day.

Atherosclerosis. Atherosclerosis is a reversible disease and not an inevitable consequence of aging. When diets low in cholesterol and fat are continued for six months or longer, there is a decrease in the plasma cholesterol level and in concentration of S_f 10–20 lipoproteins. A diet containing 0.02 gm. cholesterol and 5 gm. fat is probably no more effective than one containing 0.2 gm. cholesterol and 25 to 40 gm. fat. Since reduced cholesterol intake increases endogenous synthesis, there is insufficient evidence to warrant a change in the general dietary patterns of population groups. However, a moderately low cholesterol, low-fat diet may constitute prophylaxis for individuals with a strong familial history of atherosclerosis.

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CEREAL CHEMISTRY

Vol. 29, July, 1952

* Effect of reducing agents on gluten proteins. J. W. Pence and H. S. Olcott.—p. 292.

Reducing Agents and Gluten. Oxidizing agents are known to cause a tightening or toughening of bread dough, while reducing agents cause softening. Viscosity data obtained in experiments with reducing agents and gluten indicate that reducing agents cause either an initial contraction or fragmentation of the gluten protein molecules. The viscosity curves appear to be the result of opposing tendencies of fragmentation, which would lower the viscosity, and of unfolding and aggregation of the reduced particles, which would increase it. The ability of reducing agents to render proteins insoluble has been noted and attributed to the formation of new hydrogen bonds presumably involving sulfhydrl groups. Recent studies furnish additional evidence that sulfhydryl groups are involved in these phenomena.

ENDOCRINOLOGY

Vol. 50, May, 1952

* A sex difference in the tolerance of Wistar rats for potassium. T. Robertson.—p. 569.

Potassium Tolerance. Rats of various ages were subjected to a potassium tolerance test which consisted of four intraperitoneal injections of potassium chloride solution given at intervals of 2 hr. Both intact and adrenalectomized female rats two and one-half months old showed a greater tolerance for potassium than did comparable male rats. This was not so when older male and female rats were tested, nor was this phenomenon observed in mice. It seems there is a possibility that an ovarian section in some way enables young female rats to dispose of the excess potassium more efficiently than their male counterparts, and that the action is independent of adrenal cortical secretion.

FOOD RESEARCH

Vol. 17, July-August, 1952

* Effect of variations in blanching on quality of frozen broccoli, snap beans, and spinach. W. B. Fisher and F. O. Van Duyne.—p. 315.
* Stability of ascorbic acid during the preparation of cranberry products. J. J. Licciardello, W. B. Esselen, Jr., and C. R. Fellers.—p. 338.
* The taste interrelationship of monosodium glutamate and sucrose. E. E. Lockhart and J. E. Stanford.—p. 404.

Blanching Vegetables. Various methods of preparing vegetables for freezing are known, but research is needed to determine which procedures allow for greatest retention of nutritive value and palatability. Evaluation of blanching methods for broccoli, snap beans, and spinach was made by determining the retention of ascorbic acid after blanching by several methods and cooling, after freezing, and after three, six, and nine months' freezer storage. The palatability of the cooked frozen vegetables was also rated. Tables indicate the findings. With broccoli and snap beans, the use of the pressure pan for blanching cannot be recommended because of loss of palatability. Three-min. blanching in hot water was found to be the most satisfactory method. For spinach, blanching in hot water for 1 min. was the most successful treatment.

Ascorbic Acid and Cranberry Products. Anticipating that the findings might lead to improving the quality of canned cranberry sauce and other fruit products, the authors of this investigation sought to determine the stage at which destruction of ascorbic acid occurred in the processing of cranberry sauce and cranberry cocktail and what caused the destruction. Heat in the presence of atmospheric oxygen was shown to have a destructive effect on ascorbic acid. When the precooked berries were strained hot, 48 per cent of the acid was lost, but when they were strained cold, the loss was only 16 per cent. When cooked in a vacuum which reduced the influence of oxygen and heat, over-all loss in cranberry sauce was reduced to 8 per cent during precooking and 8 per cent during concentration. By adding a sequestering agent to reduce the effect of metals which may be present in the berries, ascorbic acid retention was also improved. The influence of different sugars was not significant.

Monosodium Glutamate and Sucrose. The effect of monosodium glutamate (MSG) on the sweetness and taste of sucrose solutions was tested by an experienced taste panel. Each of several different sucrose levels was used as a base for admixture with increasing concentrations of MSG. Statistical analysis showed that MSG-sucrose mixtures were identified as being different from plain sucrose solutions frequently enough to be significant at the 5 per cent probability level. It is inferred that identification of the sample was due more to a change in taste not related to sweetness rather than to any other factor.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 149, August 9, 1952

* Diagnosis and treatment of epileptic and epileptoid disorders. N. A. Bercel.—p. 1361.

Chromium intoxication. L. R. Pascale, S. S. Waldstein, G. Engbring, A. Dubin, and P. B. Szanto.—p. 1385.

Vol. 149, August 16, 1952

Vacations and diarrhea. Editorials and Comments.—p. 1475.

* Poisonous fish. Queries and Minor Notes.—p. 1513.
* Hypertension, cigarettes, and caffeine. Queries and Minor Notes.—p. 1514.

Enteritis in tourists. Queries and Minor Notes.—p. 1516.

Vol. 149, August 23, 1952

Problem of emotional trauma in hospital treatment of children. K. Jackson, R. Winkley, O. A. Faust, and E. G. Cermak.—p. 1536.

* Anthrax. Queries and Minor Notes.—p. 1610.

Vol. 149, August 30, 1952

Viral and bacillary dysentery. A dual epidemic. H. A. Reimann.—p. 1619.

Epileptic Disorders. Treatment of epilepsy, as of diabetes and tuberculosis, is a long-term program. Effective medication is described and proper diet therapy is mentioned. The ketogenic diet and the administration of glutamic acid are not in great favor because of technical difficulties, but it remains basically sound to decrease the intake of foods producing alkalosis and to replace them with an acidosis-producing diet. The use of alcoholic beverages in any amount is absolutely contraindicated in successful treatment of epilepsy.

Poisonous Fish. In discussing ichthyosarcotoxism, the opinion is given that it is not due to bacterial putrefaction, but rather that a poisonous alkaloid or some closely related substance is present. Many tropical marine fishes sold for food in one area (red snapper, rockcod, seabass, and other species) may be violently toxic in another. To be certain that fish is edible, tissue extracts should be prepared and injected into mice or some similar tests should be made.

Hypertension and Caffeine. It is stated that caffeine in moderate doses has little effect on arterial pressure but in excessive amounts leads to a prolonged slight rise in blood pressure.

Anthrax. Replying to a query on the possible contagion of man to anthrax occurring in swine, it is stated that there is only one type of anthrax Bacillus and that it affects many species of animals, including man. A number of precautions are suggested for the worker who must handle infested swine.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 197, August, 1952

* Cholesterol metabolism in pantothenic acid deficiency. R. R. Guehring, L. S. Hurley, and A. F. Morgan.—p. 485.
* Circulation of plasma proteins: their transport to lymph. L. L. Forker, I. L. Chaikoff, and W. O. Reinhardt.—p. 625.

Volumetric determination of calcium in blood serum. W. E. Elliott.—p. 641.

Cholesterol and Pantothenic Acid. Normal and pantothenic acid-deficient rats were fed either a normal or cholesterol-rich diet. After a test period, determinations of liver glycogen, adrenal ascorbic acid, serum cholesterol, liver cholesterol, and liver lipids were made either at sea level or at a simulated altitude of 20,000 ft. By this means the effect of pantothenic acid deficiency on the ability of the rat to metabolize cholesterol was examined. Cholesterol-rich diets resulted in fatty livers with high cholesterol levels in the liver serum of normal rats, but no rise in liver lipids and only small increases in liver cholesterol and serum cholesterol were noted in pantothenic acid-deficient rats. The resistance of the latter to the formation of fatty livers was not due to curtailment of food intake. In deficient rats, liver glycogen was not raised during stress nor were adrenal ascorbic acid levels affected by cholesterol feeding. Removal of pantothenic acid from the normal cholesterol-rich diet for two weeks led to gradual reduction of liver fat and cholesterol and serum cholesterol. Findings seem to show a specific relationship between pantothenic acid and the metabolism of cholesterol and fat.

Circulation of Plasma Proteins. As part of a study of protein turnover in diabetes, the specific activity of serum protein was observed. S^{35}-labeled serum

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proteins were introduced intravenously into dogs, and the disappearance of the proteins from the circulating plasma was followed for seven days. The specific activity of the substance decreased rapidly at first, and the explanation is offered that in this rapid phase reversible exchange occurs between plasma protein molecules in the blood stream and similar molecules in other regions of the animal. It is shown that the labeled serum, intravenously injected, appears very rapidly in the thoracic duct lymph and that a continuous circulation of protein exists between blood and lymph. In experiments on rats, the thoracic duct lymph was not returned to circulation and the rats lost approximately two-thirds of the total blood plasma protein per day, in spite of which, one rat lived for eleven days with a loss of 7.3 times its estimated normal total blood plasma protein. Consequently, it appears that the thoracic duct is not essential for the entry of newly formed plasma protein molecules into the blood stream.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 31, August, 1952

* Blood pyruvic acid response to intravenous glucose or insulin in the normal and in patients with liver disease and with diabetes mellitus. D. S. Amatuzio, N. Shrifter, F. L. Stutzman, and S. Nesbitt.—p. 751.

Blood Pyruvic Acid Response to Glucose and Insulin. The utilization of glucose in the normal subject is associated with the formation of intermediary products. A rise of blood pyruvic acid follows the administration of glucose. This response may be associated with the action of insulin on the normal metabolism of glucose and pyruvic acid. In patients with compensated cirrhosis, glucose utilization is apparently adequate, and the ability of the liver to remove pyruvic acid appears adequate. In patients in hepatic coma, an accumulation of the blood pyruvic acid occurs following the administration of glucose. In diabetes mellitus, the blood pyruvic acid failed to rise as in normal men after intravenous glucose. In mild diabetes, a slight rise occurs. This difference is related to degree of insulin deficiency of the pancreas and depends indirectly on the blood glucose level.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 21, July, 1952

* Studies on carbohydrate metabolism in toxaemia of pregnancy. 4. Acidosis and ketosis in toxaemia of pregnancy. C. Mukherjee.—p. 411.

Toxemia of Pregnancy. An adequate knowledge of the status of the alkali of the blood was considered necessary in studying carbohydrate metabolism in toxemia of pregnancy. The so-called acidosis of pregnancy is shown to be a condition of compensated alkali-deficit. A progressive fall in the alkali reserve of the plasma is characteristic of mild and severe pre-eclampsia. Fourteen cases of eclampsia showed a more noticeable depreciation of alkali reserve, and the condition which develops is an uncompensated alkali-deficit or acidemia. The carbonic buffer system is disturbed and the *pH* has a slight tendency to fall. In toxemia, the tendency to ketosis is increased, although in pre-eclampsia this is not attended with a gross disturbance of the buffer mechanism of the blood. It is possible that ketosis contributes to the failure of compensation which accompanies eclampsia.

THE JOURNAL OF NUTRITION

Vol. 47, July, 1952

* The aspartic acid, glutamic acid, proline and tyrosine content of meat. A. M. Violante, R. J. Sirny, and C. A. Elvehjem.—p. 307.
* Daily determination of plasma, serum, and white cell-platelet ascorbic acid in relationship to the excretion of ascorbic and homogentisic acids by adults maintained on a controlled diet. B. L. Davey, M. L. Wu, and C. A. Storvick.—p. 341.
* The importance of choline in the prevention of nutritional edema in rats fed low-protein diets. H. D. Alexander and R. W. Engel.—p. 361.
* The influence of ingested mineral oil upon the development of an essential fatty acid deficiency in the rat. E. K. Bacon, S. Lassen, S. M. Greenberg, J. W. Mehl, and H. J. Deuel, Jr.—p. 383.
* Nutritive value of lard as affected by the proportion of fat in the diet. R. Hoagland, G. G. Snider, and C. E. Swift.—p. 399.
* The amount of nitrogen retained by 6 young women on an intake of approximately 70 gm of protein a day. F. A. Johnston and T. J. McMillan.—p. 425.

Amino Acids in Meat. Non-essential amino acids were studied to determine their occurrence in veal, lamb, pork, and beef. The fresh meats were transformed into lyophilized, ether-extracted preparations, and the glutamic acid, aspartic acid, proline, and tyrosine contents are reported in percentages.

Ascorbic Acid Metabolism in Women. Four healthy adult women were maintained on a controlled diet with supplements to bring daily ascorbic acid intake up to 25 mg. A fifth subject received 75 mg. ascorbic acid daily. Tests showed that concentrations of both total and reduced ascorbic acid were significantly higher in serum than in plasma, and that total ascorbic acid was significantly higher than reduced in both. A daily intake of 25 mg. ascorbic acid was insufficient to maintain the ascorbic acid of the blood at a "good" level in four subjects, but a daily intake of 75 mg. ascorbic acid was sufficient in one subject. There is no evidence, on the basis of homogentisic acid excretion, that a daily intake of 25 mg. ascorbic acid is not sufficient to maintain normal metabolism of tyrosine and phenylalanine. White cell-platelet ascorbic acid levels fell to half or less of initial values in the four subjects ingesting 25 mg. ascorbic acid daily.

Edema and Choline. Severe nutritional edema has been observed in rats fed low-choline diets designed to evaluate the importance of dietary choline in preventing anemia. This study had as its objectives, first, the development of low-choline diets that would produce severe edema consistently, and second the observation of changes in blood hemoglobin, blood serum protein concentration, liver fat content, and total body composition during the edema-induction process. Low-protein diets did not produce severe edema when supplemented with choline. Edematous rats showed a lowered serum protein content, and the protein- and choline-deficient diet caused a rapid development of anemia. The edematous condition was also associated with fatty infiltration and cirrhosis of the liver.

Mineral Oil and Fatty Acid Deficiency. A number of experiments are reported which were performed to determine the effect that mineral oil might have on the development of an essential fatty acid deficiency in rats. It appears that one action of the oil is that of removing a greater than normal proportion of unsaturated fatty acids from the rats. In addition to typical symptoms of fatty acid deficiency, other symptoms were observed which suggested biotin deficiency. From this, the inference is drawn that mineral oil interferes with the rat's utilization of biotin. The experiment also indicates that there is a relationship between biotin and the essential fatty acids.

Nutritive Value of Lard. A study of the nutritional value of lard is reported along with the effects of adequate diets containing different proportions of lard on the rate and efficiency of growth of young male albino rats. Modified paired-feeding experiments with isocaloric diets containing different proportions of lard indicated no statistically significant differences in weight gain; in fat, protein, or energy storage; or in the efficiency of the utilization of food energy as related to the fat contents of the diets.

Nitrogen Retained by Young Women. Six young women twenty through thirty-one years of age were maintained for twelve weeks on a diet which was constant except for the addition of a serving of spinach a day in the last eight weeks. The nitrogen content of the urine, feces, menses, and duplicates of food was determined. The mean intake of protein on basal diet was 67.0 gm., on the diet containing spinach 71.8 gm., and on both diets for all twelve weeks 70.2 gm. The mean nitrogen retention during twelve weeks was 0.64 gm. per day, or 0.61 gm if the loss of nitrogen in the menses was deducted. The amount retained varied widely from week to week for a given subject, but the means for twelve weeks were similar for all subjects. A satisfactory amount of nitrogen was retained despite the omission of all animal protein from the breakfast. Approximately 91 per cent of the nitrogen of spinach was absorbed.

THE LANCET

No. 6728, August 9, 1952

* The maintenance therapy of pernicious anaemia with vitamin B_{12}. D. A. Brewerton and R. A. J. Asher.—p. 265.

Vitamin B_{12} for Pernicious Anemia. This study is based on thirty-six patients with pernicious anemia who had previously been treated with liver preparations and have now been receiving vitamin B_{12} for twenty months. The most striking finding was the patient's enthusiasm for this treatment. They felt

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Fat (1)	0.20 gm.	—	—
Protein (1)	0.6 gm.	1	—
Caloric Value (1)	50 calories	2	—
Calcium (1)	12 mg.	1	2
Phosphorus (1)	6.8 mg.	—	1
Iron (1)	5.8 mg.	48	58
Vitamin A (3)	37 I. U.	1	1
Thiamine (3)	0.016 mg.	1	2
Riboflavin (2)	0.016 mg.	1	1
Niacin (2)	0.22 mg.	1	—
Vitamin C (3)	15 mg.	20	50

*Percentage based on Recommended Daily Allowance for physically active man—National Research Council. **Percentage based on Minimum Daily Requirement for adult over 12 years of age—Food and Drug Administration.

1. Food Research 11, 391 (1946)
2. J. Am. Dietet. Assoc. 21, 357 (1945)
3. J. Am. Dietet. Assoc. 23, 226 (1947)

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THE NEW ENGLAND JOURNAL OF MEDICINE

Vol. 247, August 28, 1952

* Diabetes and pregnancy. D. Horwitz and N. Higano.—p. 305.

Diabetes and Pregnancy. In a study of 140 diabetic pregnant women over an eighteen-year period, it was noted that the incidence of toxemia, 29 per cent, was higher than for non-diabetic women (7 or 8 per cent). The incidence of fetal mortality could not be closely correlated with the severity or duration of maternal diabetes. Preliminary studies of a small group of patients treated orally with diethylstilbesterol appeared to show a decreased incidence of fetal mortality and maternal toxemia.

NEW YORK STATE JOURNAL OF MEDICINE

Vol. 52, August 15, 1952

* Denatured insulin: a simplified, rapid means of treatment of allergy to insulin complicating diabetic ketosis. H. Dolger.—p. 2023.

Denatured Insulin. Crystalline zinc insulin may be denatured by immersion in boiling water for a period of 30 min. Dramatic results are obtained when denatured insulin is used for patients who have become sensitive to insulin protein. Once desensitization has been accomplished in the patient with generalized allergic reaction, any type of commercial insulin may be used.

NUTRITION REVIEWS

Vol. 10, July, 1952

* Fat metabolism in the early 1900's. W. R Bloor.—p. 193.

Effect of surgery on plasma levels of essential amino acids.—p. 195.

* The intestinal flora of infants.—p. 198.

Restriction of food intake and health.—p. 199.

* Nutrient absorption following intestinal resection.—p. 202.

* Gastrointestinal X-Ray studies in thiamine deficiency.—p. 204.

Feeding problems during flight.—p. 205.

* Influence of route of administration and of sex on serum iron levels.—p. 210.

* Insulin and cocarboxylase in diabetes.—p. 214.

* The utilization of vitamin B_{12}.—p. 219.

Pantothenic acid deficiency and adrenal insufficiency.—p. 221.

Vol. 10, August, 1952

* Vitamin E. H. A. Mattill.—p. 225.

* Relation of malnutrition to fluoride toxicity.—p. 227.

* Nature and mode of action of the intrinsic factor.—p. 229.

* Vitamin D and citrate metabolism.—p. 233.

* Requirement for tryptophan.—p. 241.

* Synthesis and storage of protein.—p. 245.

* Specific gravity, skinfolds and body fat.—p. 246.

* Dietary fat and multiple sclerosis.—p. 256.

Fat Metabolism Studies. Studies of fat metabolism were impeded for many years by the difficulty of obtaining the lipids in pure form by crystallization from the mixtures in plant and animal tissues and the lack of pure compounds with which to compare them. The question of whether protagon and the fatty acids were pure substances or mixtures had long been unsolved when the beta-oxidation theory was being developed. The study of the process of fat absorption from the intestine led to the theory that there are two paths of absorption, unsplit particles going directly into the thoracic duct, and split fat being absorbed either into the portal system or into the thoracic duct with resynthesis. Bile and the bile salts were shown to combine with the fatty acids to produce water-soluble and diffusible complexes offering a mode of absorption of fatty acids. Other research in the early part of the century was concerned with the synthesis of the triglyceride fats and of lecithin, with the function of the liver in fat metabolism, and with methods for cholesterol determinations in blood and tissues.

Intestinal Flora of Infants. Much remains to be learned concerning both the factors in the diet which determine the development of characteristic intestinal flora and the relative importance of this flora in the nutrition of the host. Increasing interest in these factors in infant nutrition is being displayed. In a study of bacterial flora, hydrogen ion concentration and sugar content were determined at different levels in the intestinal tract of normal infants fed various cow's milk formulas or their mother's milk. The predominance of *Lactobacillus bifidus* flora and the greater acidity of the feces of breast-fed infants as compared with the variable flora and higher *pH* of the feces of infants fed cow's milk confirms previous studies.

Feeding after Intestinal Resection. The increased survival rate following intestinal resection presents the problem of providing adequate nutrition for patients with limited absorptive capacities. The investigations described suggest that "synthetic" diets have no advantage over natural types of foods and that a certain degree of accommodation or recovery occurs in patients with decreased intestinal surface area. Diet therapy should be directed at maintaining a high-carbohydrate, high-protein, low-fat intake to avoid the damaging effects of steatorrhea. The use of ACTH and cortisone on the types of surgical problems reviewed should be of interest.

Studies in Thiamine Deficiency. A significant incidence of low blood thiamine level has been found in older persons with symptoms generally agreed to be characteristic of B-vitamin depletion states. Recently gastrointestinal radiography has been used in evaluating nutritional status. In a study of hypothiaminemic patients between the ages of fifty-one and ninety, no gastrointestinal symptoms were present, and after their blood thiamine levels had been increased, X-ray examinations showed no significant gastrointestinal alterations. Other deficiency signs had disappeared. On the basis of this study, it appears that thiamine levels are a rather crude method of measuring hypovitaminosis.

Serum Iron Levels. Serum or plasma iron in the blood, as distinct from the iron constituent of hemoglobin, is transported in the serum with plasma protein. The iron-binding protein has been shown to be a beta$_1$-globulin which combines not only with iron but also with copper and zinc. Irrespective of the route of administration of iron to experimental rats, the added iron was found to migrate with the beta-globulin fraction. The addition of iron to human serum *in vitro* gave similar results. Sex hormones appear to influence the concentration of iron in the plasma, the possible effect of blood losses in females having been eliminated. Testosterone and progesterone were found to have no effect on serum iron levels in rabbits of either sex, but estrone and estradiol caused a rapid fall in plasma iron in both sexes.

Insulin and Cocarboxylase in Diabetes. Exceptions to the general rule that the amount of cocarboxylase in blood varies directly with the amount of total thiamine and the degree to which the tissues are saturated with the vitamin was found in diabetes. When alloxan-diabetic rats were injected with thiamine pyrophosphate, an immediate fall in the level of blood sugar and a rise in the respiratory quotient and tissue glycogen ensued. In human subjects, the blood cocarboxylase was determined in thirteen normal individuals and in sixteen diabetic patients. In diabetic subjects, insulin treatment was suspended 48 hr. before the start of the experiment. In all subjects, the cocarboxylase content of the blood was determined, insulin was administered, and cocarboxylase was again determined 30 min. later. The increase in cocarboxylase after administration of the fixed dose of insulin was inversely proportional to the severity of diabetes. It is concluded that in diabetes mellitus insulin acts in the biosynthesis of cocarboxylase and generally speaking is necessary for the normal processes of thiamine phosphorylation.

Utilization of Vitamin B_{12}. Data have seemed to indicate that vitamin B_{12} is apparently not absorbed in any large quantity in normal individuals. From recent evidence, however, it appears that in dogs, absorption of the vitamin is substantially proved on the basis of blood levels. When orally administered to rats, the vitamin showed evidence of absorption and its level in the diet had a marked effect upon its quantity in the animals' milk. In studying the influence of the diet as a whole upon the rat's absorption of vitamin B_{12}, it appeared that pork may contain a factor or factors that somehow interferes with normal utilization of the vitamin. Cobalt injections produced an expected increase in red blood cells but failed to influence the storage of vitamin B_{12} in the liver. The polycythemia-inducing action of cobalt cannot be explained on the basis of an increased formation of the vitamin in the rat. Present evidence indicates that absorption varies considerably and is affected by the general diet.

Vitamin E. The departures from the normal behavior and composition of tissues produced by lack of vitamin E include a baffling array of unexplained phenomena. The manner in which the vitamin participates in the process of reproduction is not understood. There is a wide diversity in the manifestation of

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vitamin E deficiency in different species, and the results are not "absolute." The fact that it is the principal antioxygenic component of natural fats suggests that perhaps it has a protective function as a biologic antioxidant in preventing the appearance of tissue-damaging products of oxidation. Many more clues must be provided before the role of vitamin E can be more satisfactorily explained.

Malnutrition and Fluoride Toxicity. On the basis of present knowledge, the question of whether malnutrition increases the incidence and extent of dental fluorosis (mottling) cannot be answered with certainty. However, a comparison of dental mottling was made between the inhabitants of two Italian towns and those of two towns in the United States, all having comparable fluoride-bearing water supplies. Investigators believe that the only discernible reason for the greater prevalence and severity of dental mottling among the Italians was the higher incidence of malnutrition.

Action of the Intrinsic Factor. Old and new clinical evidence leaves little doubt that enhanced absorption of vitamin B_{12} is the effect produced by the intrinsic factor. Although this conclusion by no means illuminates the obscurity of what intrinsic factor is or how it works, several experimental approaches to these questions have been made. On the basis of several observations, it may appear that the role of intrinsic factor is simply to make vitamin B_{12} unavailable for competitive utilization by intestinal bacteria. Observations further suggest that the significant action of the factor is upon the intestinal wall rather than upon the vitamin itself.

Vitamin D and Citrate Metabolism. Studies of the changes in serum citrate and urine citrate occurring in rachitic and normal infants after administration of vitamin D appear to demonstrate rather conclusively that citrate metabolism is influenced by vitamin D. The mechanism of citrate alterations during therapy remains unexplained, however. Further studies may reveal the site of action of the vitamin and perhaps attack the problem of resistant rickets.

Tryptophan Requirement. In experiments to re-evaluate the relative growth-promoting activity of L- and D-tryptophan, weanling male white rats were fed a basal diet containing no tryptophan. The substance was added in different amounts in the several experiments, and in some, the effect of niacin was also tested. The tendency toward better growth with the higher concentration of 0.20 per cent tryptophan justified the selection of this amount as the safe minimum requirement under the given experimental conditions. In the presence of the minimum requirement of the amino acid, niacin exerted no influence on growth, but when suboptimal amounts of tryptophan were provided, the vitamin stimulated growth. Contrary to earlier conclusions, D-tryptophan was shown to be inferior to the natural form in promoting growth.

Synthesis and Storage of Protein. Quantitative estimation of the rate of protein synthesis, of amino acid catabo-

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lism, and of the size of the nitrogen pool in animals in nitrogen balance compared with animals subject to induced gain in body weight and in nitrogen storage, should give a clue to the chemical mechanism involved in growth and in nitrogen storage. It appears that the nitrogen storage which is characteristic of hormone-induced growth is the net result of a depressed rate of amino acid breakdown and of an augmentation of protein synthesis. In addition, there is ample experimental evidence to support the concept of a dynamic equilibrium between the proteins of the cell and those in the blood plasma.

Body Composition. The analysis of body composition in terms of gross tissue morphology is a fairly recent but promising approach to the evaluation of important facets of nutritional status as well as of other nutritional and metabolic problems. Specific gravity determinations of the body composition of cattle have been shown to indicate the amount of adipose tissue, water content, and lean body mass with considerable accuracy. The thickness of subcutaneous fat can be measured with a malachistometer, and body build in men has been evaluated by means of ratings from photographs, in conjunction with specific gravity determinations. The studies indicate the severe limitations of the "standard" body weight statistics. Additional data are needed to indicate the "standard" fat percentages at different ages.

Fat and Multiple Sclerosis. The etiology of multiple sclerosis has been unknown, although among the many possible causes, nutritional deficiencies, especially of the B-complex vitamins, have been considered. Excess fat in the diet has been suggested as another possible nutritional factor responsible for the disease. Statistics compiled in Norway, Denmark, Holland, and Switzerland in regard to incidence of the disease and dietary habits before, during, and after World War II indicate that a high intake of fat seemed to increase the incidence of the disease by precipitating it in susceptible persons.

NUTRITION SYMPOSIUM SERIES

No. 5, August, 1952

* The metabolic role of crystalline vitamin B_{12}. B. F. Chow.—p. 1.
* Some observations on substances combining with vitamin B_{12}. B. F. Chow and R. L. Davis.—p. 17.
* Role of the vitamins in antibody production. A. E. Axelrod.—p. 27.
* Adrenal function in pantothenic acid deficiency. W. A. Krehl, R. W. Winters, and R. B. Schultz.—p. 39.
* Some studies on the role of certain of the B vitamins in leukopoiesis. D. R. Weir and R. W. Heinle.—p. 70.
* The effect of certain nutritional factors on the reactions produced by acute stress in human subjects. E. P. Ralli.—p. 78.
* The skin lesions of human pyridoxine deficiency and their relationship to seborrheic dermatitis of the sicca type. R. W. Vilter and W. Schreiner.—p. 104.

Metabolism and Vitamin B_{12}. Vitamin B_{12} has been studied for several years in regard to its fate following oral or parenteral administration, its influence on protein and carbohydrate utilization, and the influence of intestinal flora on the vitamin. The method of administration does not seem to affect the retention of the labelled vitamin in the liver, kidneys, pancreas, and so on, where radioactivity was found to be present as long as three months after injection. This indicates that vitamin B_{12} is incorporated tenaciously in the cells of tissues. It appears more likely to be involved with carbohydrate or fat metabolism than with that of protein, and its passage through the intestinal tract seems to be delayed by its combination with gastric juice, indicating that this is one of the primary functions of the latter substance.

Combining Substances. The procedures described represent a search for compounds with a strong binding power for vitamin B_{12} that will have the therapeutic properties of Castle's intrinsic factor in the treatment of pernicious anemia. At least four such naturally occurring substances have been discovered, and they seem to enhance the absorption of orally administered vitamin B_{12}, as shown by increased urinary radioactivity and decreased fecal activity in normal rats.

Vitamins and Antibody Production. There is evidence that certain B vitamins, such as pyridoxine, pantothenic acid, and pteroylglutamic acid, are significant in antibody synthesis. Therefore it seems likely that the regulation of vitamin intake may prove a useful tool in determining the mechanisms of the process. Since the antibodies represent a class of specialized proteins, this should lead to information regarding the processes of protein anabolism in general.

Adrenal Function and Vitamin Deficiency. From the findings presented, it is concluded that the adrenal cortex of the pantothenate-deficient rat is insufficient with respect to functions usually attributed to the C-11 oxysteroid hormone of this gland. Biochemical evidence indicates that the body uses "active acetate" for building the cholesterol molecule and the coenzyme A, which contains pantothenic acid, and plays an important role in the metabolism of "active acetate." If the pantothenic acid is low, the amount of coenzyme A may be low, interfering with the whole process. This could be expected to result in decreased content of adrenal cholesterol with a possible further result of a decrease in the output of adrenal hormone. The possibility that the deficient gland may be insufficient in electrolyte functions also has not been demonstrated conclusively.

B Vitamins and Leukopoiesis. It is known that B vitamins play an important role in the formation of red blood corpuscles, but studies of the effects of B vitamin deficiencies often do not include specific observations of resulting hematopoietic changes. The changes observed in the studies reported here are believed to be due specifically to the deficiency states induced, i.e., those of pyridoxine and pantothenic acid.

Nutritional Factors in Stress. Since it appears that the response to stress may be influenced by certain nutritional fac-

Meat...

and its Wide Clinical Applicability

That meat is an important component of the high protein diet[1] employed in the treatment of many pathologic states is evident from the following dietary suggestions that have been recommended by some authorities in the field of nutrition:

Protein of good quality and in adequate amounts is the most effective dietary agent for protecting the liver from damage and for promoting its repair.[2] In the long-term management of chronic liver disease, a suggested diet includes at least 4 ounces of lean lamb, veal, or beef in both the noon and evening meals.[3]

Among the nutritional needs of patients with chronic ulcerative colitis is protein.[4] For such patients a recommended diet includes 4 ounces of tender meat with luncheon and with dinner.[5a]

In diabetes mellitus, maintenance of protein reserves is important for supporting well-being and vigor, for maintaining resistance to infection, and, in conjunction with good general management, for minimizing many of the degenerative changes commonly seen in this condition.[6,7] One ounce of bacon at breakfast and 2½ ounces of cooked meat at each of the other two meals are valuable in a diabetic diet.[5b]

A program of treatment[8] found useful in atherosclerosis of the coronary vessels includes an adequate diet low in fat (20-25 Gm. daily) and normal or moderately high in protein (60-100 Gm. daily), in conjunction with lipotropic agents. A sample menu of this diet lists 2 ounces of lean meat at both the noon and evening meals.

Underweight or average weight patients with persistent low blood sugar levels are benefited by a high protein diet providing meat two or three times a day.[9] In overweight patients of this type, lean meat is served at luncheon and at dinner.

During convalescence from infectious disease, the importance of "high protein-high calorie" diets including generous servings of meat deserves emphasis.[10] For this purpose, a suggested typical daily menu schedule which results in weight gain, improved vigor, and a restored sense of well-being furnishes ½ ounce of bacon at breakfast and 3 ounces of meat at each of the other meals. Supplementary feedings may include additional amounts of meat.

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2. Patek, A. J., Jr.: Evaluation of Dietary Factors in Treatment of Laennec's Cirrhosis of Liver, J. Mt. Sinai Hosp. *14*:1 (May-June) 1947.
3. Portis, S. A., and Weinberg, S.: Recent Advances in the Medical Treatment of Cirrhosis of the Liver, J.A.M.A. *149*:1265 (Aug. 2) 1952.
4. Welch, C. S.; Adams, M., and Wakefield, E. G.: Metabolic Studies on Chronic Ulcerative Colitis, J. Clin. Investigation *16*:161 (Jan.) 1937.
5. (a) Mayo Clinic Diet Manual, Philadelphia, W. B. Saunders Company, 1949, p. 89.
   (b) Ibid., p. 133.
6. Mosenthal, H. O.: Management of Diabetes Mellitus, An Analysis of Present-Day Methods of Treatment, Ann. Int. Med. *29*:79 (July) 1948.
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8. Morrison, L. M.: Arteriosclerosis: Recent Advances in the Dietary and Medical Treatment, J.A.M.A. *145*:1232 (Apr. 21) 1951.
9. Low Blood Sugar Level; Queries and Minor Notes, J.A.M.A. *149*:1358 (Aug. 2) 1952.
10. Goodman, J. I., and Garvin, R. O: Results of High Calorie Feeding, Gastroenterology *6*:537 (June) 1946.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

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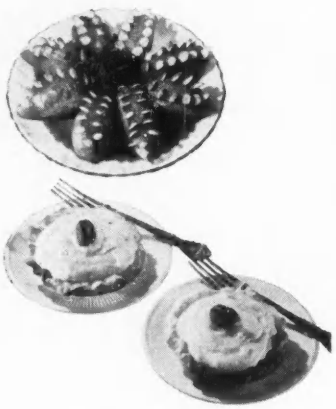

The dietitians Utopia—variety in every meal. *This can be done*, with economy, too. Try Golden Louisiana Yams—prepared dozens of different ways . . . Creamy soups, rich ice creams, crisp salads—each dish brimming with vitamin and mineral content.

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tors, it is interesting to speculate on the mechanism by which pantothenic acid may influence the reaction to stress. The administration of calcium pantothenate in large doses influenced some of the blood and urinary findings elicited by immersing young men in cold water. Pantothenic acid significantly affected the eosinophile response, the ascorbic acid level in the blood, the uric acid/creatinine ratio, the magnitude of the white blood cell response, and the serum cholesterol level. Such observations suggest that cellular response to stress may be influenced by the administration of substances which are important to intracellular reactions, and that provision of a propitious intracellular situation under stress may decrease the need for excessive production of adrenal cortical hormones.

Skin Lesions of Pyridoxine Deficiency. Patients with natural seborrheic dermatitis have a metabolic defect in the skin, possibly because of an error in fatty acid metabolism. Studies are in progress to determine whether the metabolic condition increases the requirement for pyridoxine locally, imposes a barrier to pyridoxine transport from blood vessels to skin, or leads to increased destruction of pyridoxine in the skin. The fundamental abnormality is not simple pyridoxine deficiency, and other local inadequacies of essential nutrients may exist to account for diseases of much more serious import.

PUBLIC HEALTH REPORTS

Vol. 67, August, 1952

- Dietary standards in the United States. L. A. Maynard.—p. 784.
- Family food consumption studies. C. M. Coons.—p. 788.
- Refuse-can holders. R. J. Van Derwerker and C. C. Johnson, Jr.—p. 802.

U. S. Dietary Standards. The table of dietary standards, formulated by the Food and Nutrition Board of the National Research Council, as revised in 1948, is presented with an explanation of how the recommendations were arrived at and what they mean in actual application. Specific requirements discussed are those for calories, calcium, vitamin A, and ascorbic acid. A report by the Committee on Dietary Allowances to local civil defense agencies points out that it is unrealistic to expect to provide adequate diets for a large population in emergencies. Foods to supply energy needs should suffice for the first days of an emergency. If prolonged, people concerned with emergency feeding must be prepared to face the problem of providing other required nutrients.

Family Food Consumption. Data relating income, family size, and education to family diet are furnished as the result of a survey of family food consumption made in four areas of the United States. From 1942 to 1948 diets were improved at all income levels but most strikingly among the low-third income group. Underconsuming groups are most likely to be found among low-income families of large size with homemakers of less than high school education. Dietary quality can usually be predicted from the consumption of milk and fruits and vegetables rich in ascorbic acid. Calcium and ascorbic acid content of diets are usually most indicative of nutritive adequacy.

Refuse-Can Holders. Sanitary storage of refuse is a desirable goal for every community. The refuse-can holder, rack, or stand which raises the can at least 12 in. from the ground is recommended because: it allows adequate space for cleaning underneath the can and prevents rodents from burrowing under it; air circulation across the bottom keeps the can dry and prevents corrosion; and children or pets cannot tip it over. Diagrams and materials for constructing a wooden stand for a 30-gal. can are given.

SCIENCE

Vol. 116, August 8, 1952

- Body build and body composition. J. Brožek and A. Keys.—p. 140.

Vol. 116, August 29, 1952

- Dental caries in rats fed a diet containing processed cereal foods and a low content of refined sugar. F. J. McClure.—p. 229.

Vol. 116, September 5, 1952

- The function of vitamin C in the adrenal cortex. C. D. Hughes, M. J. Swenson, G. K. L. Underbjerg, and J. S. Hughes.—p. 252.
- Examination of human fat for the presence of DDT. G. W. Pearce, A. M. Mattson, and W. J. Hayes, Jr.—p. 254.

Body Build and Nutrition. Somatotype rating, originally proposed as a means for describing body type, has been shown to be markedly affected by changes in the body's nutritional status and may therefore be considered as a partial measure of nutriture. The relationship between somatotype ratings and specific gravity in thirty-one young men, examined under control conditions and after twenty-four weeks of semi-starvation, is reported. The men, who were somatotyped in two independent sets of ratings on the basis of photographs, lost one-quarter of their body weight and showed a marked loss of body fat. The findings are in essential agreement with previous ones which showed a high negative correlation between specific gravity and endomorphy and a positive correlation between specific gravity and ectomorphy. It is not suggested that the ratings be used to indicate the amount of body fat in itself. Rather, the principal concern of nutritionally oriented anthropometry is to provide an estimation of the absolute and relative amounts of fat, of muscles, and of bones.

Diet and Dental Caries. A basal diet of commercial glucose, enriched rye bread, enriched white bread, cooked rolled oats, cooked yellow corn grits, and sodium chloride was devised in an attempt to formulate a dietary regimen that would produce in rats a satisfactory analog of human dental caries. Caries production was variable, but over a two-year period of studies on approximately five hundred rats, the diet appeared to produce carious areas on the gingival outline and mostly on buccal surfaces of lower molars. Lingual and mesial surfaces were sometimes involved also. These are the surfaces in human dentition that are highly susceptible to caries. The diet is deficient in a num-

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Youngsters and active people of all ages enjoy KARO every day ... and thrive on its quick food energy. Added to other foods at the table—a favorite on pancakes—or used in cooking, KARO is a delicious sweetener and ideal energy food.

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For the normal aged, a high carbohydrate diet (up to 60% of intake) ... is indicated by current clinical knowledge. KARO added to milk, cereals or fruits, offers an ideal way to supply a portion of the daily carbohydrate needs.

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is a complete carbohydrate ... a balanced mixture of dextrins, maltose, dextrose.

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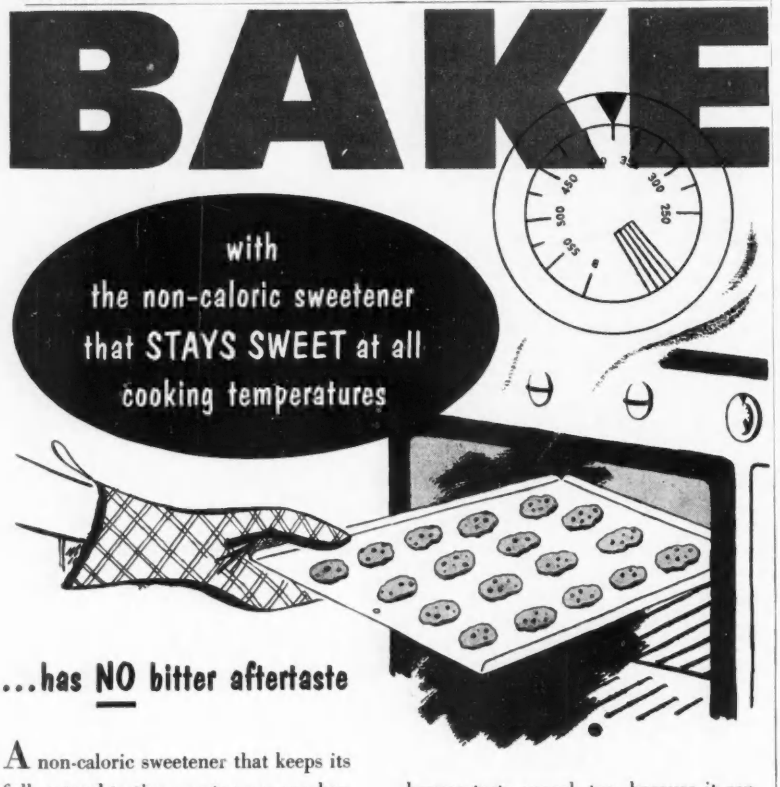
ber of essentials. With it, growth is impaired and mortality is high. The obvious inadequacy of the cereal protein, particularly the lysine content, and the fact that the cereals have been heat-processed, have suggested a somewhat new approach to problems of nutrition in relation to dental caries. The effects of heat-processing in connection with the caries potential of the diet are being investigated.

Ascorbic Acid in the Adrenal Cortex. Of the two types of compounds produced by the adrenal cortex under usual conditions, cortisone tends to inhibit the development of arthritic lesions in scorbutic guinea pigs whereas desoxycorticosterone promotes such lesions. With a diet deficient in ascorbic acid, it appears that the adrenal cortex does not produce enough cortisone to prevent severe arthritic lesions. In an experiment to determine whether ACTH has an action similar to that of cortisone, five groups of female guinea pigs were fed a basal ration deficient in ascorbic acid. One group received no supplementary injections, another was injected with cortisone acetate, another with ACTH, the fourth with desoxycorticosterone, and the fifth with ascorbic acid. The results showed that ACTH and desoxycorticosterone aggravated the arthritic condition of the animal, whereas cortisone suppressed clinical symptoms.

DDT in Human Fat. Presumably the DDT occurring in human fat arises mainly through eating contaminated common foods. In analyzing DDT deposits in human fat, it was found that a large proportion was DDE, a degradation product of DDT. Of the total of DDT plus DDE, the range for DDE was found to be from 33 to 90 per cent, and most samples were found to contain more DDE than DDT. It is not known whether the degradation of DDT to DDE occurs on the plant products prior to ingestion, during digestion, or after deposition in the fat. However, its occurrence in substantial quantities in fat of persons known to have been exposed to DDT suggests that the possible health hazards involved in the widespread use of DDT need to be reconsidered and investigated further.



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SOUTHERN MEDICAL JOURNAL

Vol. 45, August, 1952

* The etiology and treatment of hepatic coma. R. A. Wise.—p. 716.

Fluoridation of public drinking waters. J. W. Knutson.—p. 748.

Hepatic Coma. Hepatic coma has been considered a serious medical situation with death to be expected in a high percentage of cases. Measures used in combating liver cell damage include: (a) thiamine chloride, niacin, and pyridoxine given as medication because of their value in enzyme systems related to carbohydrate metabolism; (b) ascorbic acid given to aid the adrenal glands in recovery; (c) tube feeding using a formula of 150 gm. protein and 150 gm. carbohydrate in 2 liters of liquid; (d) glucose and water with potassium chloride and water-soluble vitamins added. The potassium serum levels and electrocardiograph control are necessary. Aureomycin may be of value. Definite value of vitamin E in therapy has not been established.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 13, August, 1952

* The coffee break increases efficiency and morale. —p. 25.
* Can we justify greater use of student labor? D. E. Lake.—p. 26.
* Mechanics of a program for student personnel. R. T. Larson.—p. 27.
* Don't ignore the food director when planning a kitchen. N. Gleason.—p. 47.

The Coffee Break. An employee defends the coffee break. The increase in worker efficiency, 14 per cent in a recent Chicago survey, more than offsets the dollar loss and also helps personnel relations.

Student Labor. Effective utilization of student labor in the Nebraska Student Union is important in controlling operating costs. Adequate management of student employees provides a sound operating organization at less cost than with full-time employees. Job education and proper allocation of responsibilities and duties with continuous day-to-day supervision are essential to an adequate personnel system.

Program for Student Personnel. The techniques used to meet student labor problems at Nebraska are an important part of the personnel system. Records

Most good reducing diets call for three fruits daily

Here is why so many include delicious California **Prunes**

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A common failing of many reducing diets is their deficiency in iron—a vital mineral which must be provided daily to the body. Prunes rank high among all fruits in iron content.

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Many people won't keep to a diet because it leaves them feeling listless and tired. Prunes help combat these feelings with their high content of quickly assimilable sugars. These sugars quickly provide food energy for relieving fatigue due to excessive demands upon stored energy. Prunes' natural sweetness also helps satisfy the dieter's "sweet tooth."

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California Prunes are among the fruits richest in essential vitamins A and B_2. They also are a good source of other B vitamins—plus important manganese, potassium, calcium, phosphorus and other minerals.

TABLE OF FRUIT EXCHANGES

(based on *Food Values of Portions Commonly Used*, Bowes and Church, 7th Ed., 1951.)

4 medium-sized prunes, cooked without sugar, total about 86 calories—approximately the same calorie count as these other fruit servings:

1 med.-size raw apple	**½ med.-size grapefruit**
4-5 med.-size apricots	**1 med.-size orange**
1 small banana	**1 cup sliced peaches**

1 large slice canned pineapple

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High iron requirements during pregnancy and lactation make prunes an excellent fruit to include in these special diets. Their vitamin content is equally valuable.

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and forms provide a foundation for the program in which every effort is made to solve the "evils" of student labor: large turnover, inefficiency, and control. The program has resulted in benefits to the Union operation, the customers, and the employees.

Planning a Kitchen. When planning a kitchen and dining room, the food director should be consulted as the person most able to determine present minimum needs and foresee possible future needs. Even though the food service director is not trained as an engineer, she can in most cases decide better than anyone else what the final kitchen layout should be.

FORECAST FOR HOME ECONOMISTS

Vol. 68, September, 1952

* U. S. regional cookbooks. C. E. Biester.—p. 42.

Regional Cookbooks. "Our cookery literature is an amalgam," says the author; American dishes, commonly thought of as regional, are really of mixed origin. National groups who settled in different sections of the U. S. brought their recipes with them, and the recipes were gradually adapted and added to the list of American favorites. Food habits and traditions of the original countries were modified to some extent by the new surroundings and available foods, and where peoples from various countries intermingled, new food patterns evolved which combined two or more nations' customs and dishes. Described here as examples are: New England cookery, which is a merger of English and Indian; southern cuisine, including several types, notably the Creole; German influences in Pennsylvania; composite influences in the Middle West; Rocky Mountain cookery, which is like the Middle West but affected by altitude; Mexican food patterns in the Southwest; and the cosmopolitan food of the Pacific Coast. A comprehensive bibliography of cookbooks specializing in the dishes of each region is included.

HOSPITAL MANAGEMENT

Vol. 72, August, 1952

* Organization, planning and directing recruitment of non-professional dietary personnel. E. A. Carpenter.—p. 78.

Nonprofessional Personnel. Here are outlined the necessary steps to be considered in obtaining an organization of good nonprofessional personnel. First the objectives of the institution must be analyzed, then the jobs clearly defined which work toward those aims. Quality work depends on quality workers. Fit the worker to the job considering sex, age, intelligence, aptitude, attitude, emotional stability, marital status, physical status, and personal habits. Sources of labor suggested are: promotion within the department, the newspaper advertisement, employment agencies, churches and missions, high schools, and vocational schools.

HOSPITALS

Vol. 26, September, 1952

* Food service by contract—an unusual experiment. C. C. Clay and C. E. Gould.—p. 117.

Food Service by Contract. An industrial food management firm was asked to operate the Dietary Department at the Hospital Center in Orange, New Jersey, when the chief dietitian resigned. The hospital specifies the food to be served, prices to be charged in the pay cafeteria, and details such as meal hours. The industrial firm agreed to operate as an integral part of the institution and to maintain a complete system of cost accounting for the dietary department. The resident food service manager was only to be present during the reorganization period, after which time the managing dietitian was to carry on alone. The article closes with a warning: hospitals and other institutions desiring to try such a plan should make certain that the industrial food management firm being considered will be able to live up to a contract.

HOTEL MANAGEMENT

Vol. 62, August, 1952

Food briefs.—p. 19.

* Lamb. P. P. Logan.—p. 55.

* Late summer salads and aspics. A. Easton.—p. 61.

Lamb. The factors which determine the grade of lamb, the wholesale cuts,

a complete line without a break...
in 7 colors
POWDER BLUE
GOLDEN YELLOW
SEA FOAM GREEN
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STONE GRAY
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Dinnerware that is practically unbreakable... in seven solid colors that are unbeatable... that's BOONTONWARE.
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BOONTON MOLDING COMPANY, Boonton, New Jersey

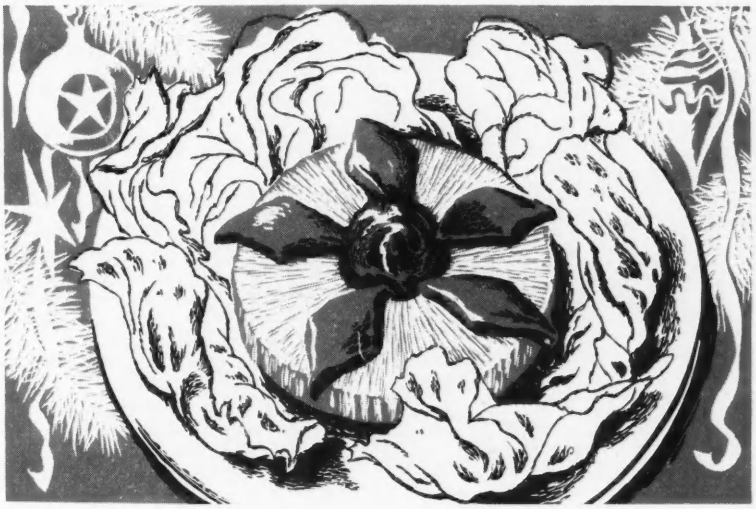
Patricia Collier

DOLE HOME ECONOMIST

Gives you a double helping of

Happy Holiday Fare!

Pretty as a Christmas tree ball is Patricia Collier's festive salad for Thanksgiving or Christmas dinner! It stars those mellow, flavor-rich DOLE Pineapple Slices and the season's favorite flower, the poinsettia.



How to make the POINSETTIA SALAD:

Place a DOLE Pineapple Slice on crisp greens and fill center with peanut butter. Arrange five colorful "petals" of pimiento on pineapple. Pass dressing made by folding together whipped cream, mayonnaise and pineapple syrup. Pretty as a Christmas card – good with turkey, chicken, ham or roast beef.

(P.S. Here's a tasty Pineapple Topping for your holiday steamed puddings: To unsweetened whipped cream, fold in drained DOLE crisp-cut *Crushed Pineapple; sprinkle with nutmeg, or cinnamon. It's different, not too sweet, and a good way to use a left-over ⅓ or ½ cup of crushed pineapple.)*

"For those after-the-holiday lunches and parties," says Patricia Collier, "Turkey Pineapple Salad is an all-time favorite. For an individual serving, mound your favorite turkey or chicken salad on a tender, juice-laden DOLE Pineapple Slice nestled on a lettuce leaf. So easy – so delicious!"

Patricia Collier, DOLE Home Economist,
215 Market Street, San Francisco 6, Calif.

Have you seen "The Golden Touch?" – DOLE's 16 mm color film for classroom use? For bookings write Modern Talking Picture Service, 45 Rockefeller Plaza, New York, or 196 S. Vermont St., Los Angeles, California.

and their percentage of dressed weight to the whole are discussed.

Salads. The dressing is what makes a tossed salad outstanding. Use garlic-flavored oil, a sprinkling of fine cut toasted croutons, a dash of lemon juice, or a bit of Roquefort cheese. Ideas for small salads include: green beans with sliced radishes, sliced tomatoes with diced celery and green peppers, a pear half with cream cheese rolled in toasted cake or macaroon crumbs, and grated carrot with diced celery and raisins.

THE HOTEL MONTHLY

Vol. 60, September, 1952

- Advance planning won immediate patronage.—p. 28.
- For better breakfast business every month in the year.—p. 57.
- Experimental fryer reveals facts about French-frying.—p. 64.

Advance Planning Won Patronage. An attractive cafe operated in connection with a large midwestern hotel is described. It is unique in that it has an individual kitchen in the same room as the hotel's coffee shop kitchen. The common point between the two kitchens is the dishwashing installation which serves both food operations; otherwise, an "invisible wall" seems to separate the two. Provision has been made to separate the dining room from the bar and cocktail lounge with movable partitions so that the cafe section may be used independently if such a procedure seems desirable.

Better Breakfasts Year-Round. Designation of September as "Better Breakfast Month" does not preclude offering guests better breakfasts every month. The article urges stress on appetite appeal through attractive and varied menus and eye appeal in the foods themselves. "Cereal *and* fruit" is again emphasized as proper rather than the too-commonly-found choice between the two. Suggestions are given for decorative and nourishing fruit-cereal combinations.

French-Frying. An experimental fryer has been developed which will more than triple the usable heat production of most contemporary fryers. High heat efficiency, it was found, equals high production. Many fryers were discovered to operate normally with loads having a fat-to-potato weight ratio of eight to one, with cycle times averaging 10 to 12 min. The experimental fryer, however, averaged a six to one ratio with a 4½-min. cycle time. A complete cycle comprises frying time plus recovery time for fat temperature to return to starting temperature. Sketches and graphs illustrate the experimental fryer's design and desirability.

THE MODERN HOSPITAL

Vol. 79, September, 1952

- How human relations studies contribute to personnel administration. K. O. Taylor.—p. 62.
- Food service in small hospitals. 2. Preparation of vegetables and meat. R. C. Lifquist and J. Hartman.—p. 112.

Human Relations Studies. In seeking a solution to the problem of personnel relations, the study of human relations has developed as a special field. Two research centers have been doing work to make now-existing knowledge more nearly exact, although not necessarily perfect. Students have drawn on clinical and social psychology, anthropology, and general experience for their findings. A recent article about hospital personnel relations is quoted. Three bases for employees' psychologic security are discussed: (a) an atmosphere of approval; (b) knowledge; and (c) consistent discipline. If these are provided, turnover will be reduced.

Food Service in Small Hospitals. Vegetables and meat are the subject of this article, second in a series. The authors list the six most important steps to be considered in preparing and serving good meals: well planned menus, good buying practices, adequate storage facilities, standardized recipes, skillful food preparation, and attractive food service. In the section on vegetables, buying and storage are discussed, and a short list is given of maximum storage periods. A timetable is given for cooking vegetables, and general rules for preparation are presented, as well as rules for specific vegetables. Meat purchasing and cooking are also discussed. A cooking guide for different cuts of beef, veal, pork, and lamb is presented in tabular form, and a time-and-temperature table for roasting meats and poultry also accompanies the article.

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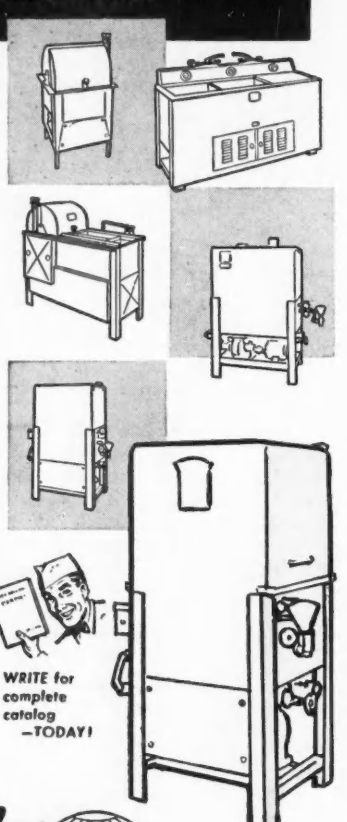

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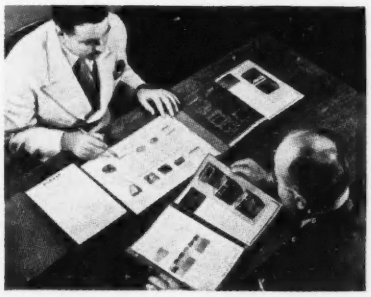
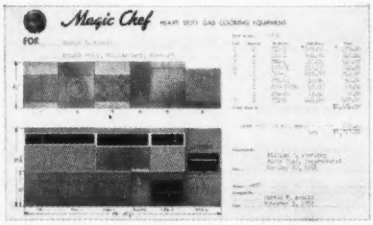
Commercial Range Layout Service Offered Customers By *Magic Chef*, Inc.

Experienced Men Study Requirements, Recommend Proper Gas Cooking Equipment For Each Individual Job.



Magic Chef, Inc., St. Louis, recently announced a personalized kitchen survey service, where experienced commercial cooking representatives investigate requirements of individual kitchens, then submit formal proposals to the owners or managers in the dealers' names, showing the recommended *Magic Chef* equipment.

Pictured below is an actual photograph of such a proposal, showing top view, front view, measurements and prices.



The proposal also contains a specification page on each unit, including all pertinent information about the proposed equipment.

The *Magic Chef* representative first contacts the chef, owner, dietician or manager to determine the requirements, menu variety, etc. The layout is then made from scale drawings, exactly as it will appear in the completed kitchen installation.

Result: a highly efficient kitchen that can meet severe production demands economically and on schedule.

Automatic oven lighting*, the accurate Red Wheel Oven Heat Regulator, heavily insulated ovens, and a choice of designed-for-the-job cooking tops are credited with startling sales gains at *Magic Chef*. The line enables owners and chefs to realize the heaviest output-per-man-hour in the history of the business.

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RADIANT BROILERS • DEEP FAT FRYERS

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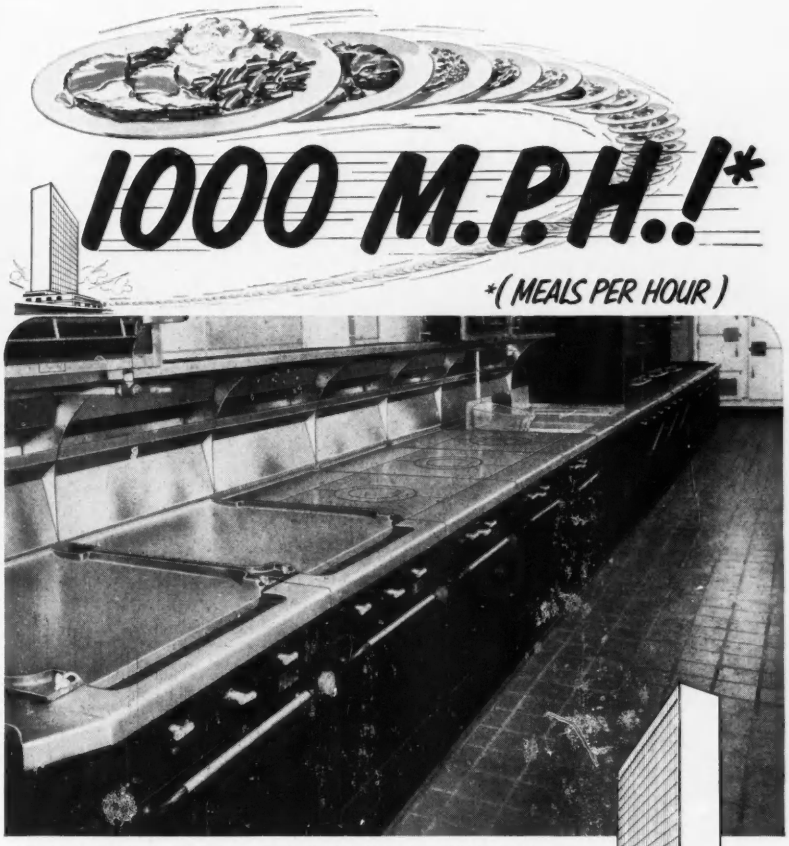
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Keep 'em flying with *Magic Chef!* In the nation's leading hotels, restaurants, institutions—*wherever* fast volume is the key to higher food service profits—you'll find this famous brand. *Magic Chef* installations produce tons of tastier food, year after year. The Red Wheel Regulator, automatic oven lighting, and many other step-saving features *keep* kitchen crews at top efficiency, speed production, keep profits *up!* Get the facts *now!*
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News Notes

"Dietetic Intern Makes Friends with a Young Patient" is the title of the photograph at the left, first prize winner in the Second Annual A.D.A. Photographic Contest. Norma Dalesio, Follansbee, West Virginia, is the dietetic intern at Shadyside Hospital, Pittsburgh, who is enjoying infant patient Gail Ann Stanford of Pittsburgh. The photograph was submitted by Irene Willson, Director of the Dietary Department of the hospital.

Dr. Ohlson New USAF Consultant. Dr. Margaret A. Ohlson, immediate Past-President of A.D.A., has been appointed Dietetic Consultant for the Air Force Medical Service. As national consultant, Dr. Ohlson will serve as advisor to the Surgeon General on technical and professional matters pertaining to personnel and operation of the food service in Air Force hospitals both in the United States and overseas.

Clinical Center Appointment. Announcement has been made of the appointment of Edith A. Jones as Chief of the Nutrition Department of the U.S. Public Health Service's new 500-bed Clinical Center at Bethesda, Maryland. The Clinical Center, which will open in April, is to be the clinical research facility of the National Institutes of Health, the chief research arm of the Public Health Service.

Miss Jones, prior to her new appointment, was Dietitian Consultant, Division of Hospital Facilities of the Public Health Service. In her hew work she will hold a rank of Senior Dietitian in the commissioned corps of the Public Health Service—a rank equivalent to that of Commander in the Navy.

She is a graduate of the University of Alabama and took a dietetic internship at The Johns Hopkins Hospital, later receiving a Master of Science degree in nutrition from the University of Tennessee. She had had working experience at Johns Hopkins and with the Army during World War II.

Postdoctoral Awards in Statistics. Three postdoctoral fellowships in statistics are being offered for 1953-54 by the University of Chicago. The fellowships, worth $4000 each, are open to holders of the doctor's degree or its equivalent in research accomplishment. Their purpose is to acquaint established research workers in the biologic, physical, and social sciences with the increasing importance of modern statistical analysis in planning experiments and other investigative programs and in analyzing empiric data. Application instructions may be obtained from the Committee on Statistics, University of Chicago, Chicago 37. Closing date for applications is February 1, 1953.

Correction. An error was made in the by-line of the article "Psychologic Facts and Dietary Fancies" which appeared in the September issue. The author, Harriett Bruce Moore, was incorrectly listed as holding a doctorate degree, and she has requested the editors to make this correction.

Plentiful Foods. The U.S.D.A. lists the following foods among those expected to be in plentiful supply during November:

Fruits and vegetables	
Beans, dry baby Limas	Figs, domestic dried
Carrots	Grapes, table
	Raisins
Protein foods	
Buttermilk	Milk, nonfat dry solids
Cheese, cottage	Tuna, canned
Fish, frozen	Turkeys
Pork	
Other foods	
Almonds	Lard
Fat, table	Salad oils
Filberts	Shortening, vegetable
Honey	Walnuts

Sanitation Booklet. The National Sanitation Foundation, Ann Arbor, Michigan, has just issued a new publication on its standards for *Soda Fountain and Luncheonette Equipment*. It is the first of a series of "standards" booklets which the Foundation will issue, and contains standards recommended for the guidance of public health officials, manufacturers, and users of equipment. These standards were prepared by an industry task committee working in cooperation with the Joint Committee on Food Equipment Standards and have been approved by the Council of Consultants of the National Sanitation Foundation. They apply only to new equipment. As an aid to all concerned in recognizing approved equipment, the National Sanitation Foundation has established a policy under which the use of its insigne "NSF" will be authorized on equipments of types that meet the standards established and published in this booklet.

The standards listed in the first release are broken down into "general specifications" and those for individual units, i.e., food units—refrigerated, food units—not refrigerated, hot food units, sink sections, and so forth. The general specifications particularly are applicable to all types of food service installations, not just soda fountain and luncheonette equipment. Copies of the booklet may be obtained from the Foundation for 50 cents each.

Program Planning. The magazine *Adult Leadership* has just released a pertinent eight-page aid titled "Your Program Planning Tool-Kit." The material, which appeared originally in the magazine itself, is based on materials prepared by Malcolm S. Knowles, author of *Informal Adult Education*. It includes information on various types of programs for adults. Eight points of a good program are listed; the importance of determining needs and interest and of spelling out objectives is emphasized; methods that can be used to gain different objectives are enumerated; methods of evaluating programs are given; and a bibliography adds source material. An especially "handy checklist" presents in box form the methods, characteristics, patterns of participation, usefulness, and limitations of various methods of handling group meetings. The person interested in "buzz groups," group discussion and decision, and other methods of dynamic group management will find this booklet of great help. The over-all picture is summarized in concise, readable language and is made even more palatable with sprightly and appropriate cartoons in the modern manner. This reprint may be obtained for 20 cents a copy from Adult Leadership, 743 North Wabash Avenue, Chicago 11.

Booklet on Dental Health. *Diet and Dental Health* is now available from the American Dental Association in a revised edition. The text includes information on: (a) the importance of the diet in the development of the teeth and jaws; (b) diet and dental caries; (c) diet and periodontal disease; (d) physical character of the food; (e) vitamin sup-

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DINNER MENU

(based on recipes from Gerber's "Special Diet" booklet)

Tomato-Vegetable Cocktail (p. 14)

Meat Patties* (p. 23)

Baked Potato and Vegetable Special (p. 22)

Plum Sherbet (p. 38)

* * *

***MEAT PATTIES**

1 can Gerber's Junior Beef or Veal

2 Tbs. Gerber's Cereal

1 Tbs. milk

1 Tbs. melted butter or margarine

Additional Cereal for rolling

Mix meat, cereal, and milk. Shape into two cakes. Roll in cereal; brush lightly with melted butter or margarine. Bake on greased pan in hot oven (400° F.) until lightly browned.

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plements; and (f) good diet for good health. The essential daily foods for adequate nutrition of children are presented in tabular form. Another table, titled "Hidden Sugar," lists the approximate refined carbohydrate content of popular foods. Two more tables present, respectively, the mineral elements in nutrition (sources, functions, and dietary allowances), and daily dietary needs of men, women, and children, based on the Recommended Dietary Allowances. The booklet may be obtained on request from the Division of Dental Health Education, American Dental Association, 222 East Superior Street, Chicago 11.

Nutrition Education Bibliography. "A Selected Bibliography of Catalogs Listing Teaching Aids for Nutrition Education" has been released for distribution by the Nutrition Foundation, Inc. The bibliography, a five-page mimeographed sheet, was compiled by Helen S. Lockhart, Department of Nutrition, Harvard School of Public Health, Boston. It lists catalogs of films and filmstrips available from thirteen sources as well as three sources of visual teaching aids. Only those catalogs which are regularly revised have been selected. The bibliography may be purchased for 15 cents from the Nutrition Foundation, Inc., Chrysler Building, New York 17.

Career Slides. The Toledo (Ohio) Home Economics Association has prepared three sets of twenty slides showing opportunities for girls in home economics. The pictures show home economists in welfare, business, dietetics, teaching, and homemaking. The slides may be obtained at a cost of $1 plus return postage and insurance. Further information may be obtained from Betty Quinton, 2701 Oatis Street, Toledo 6.

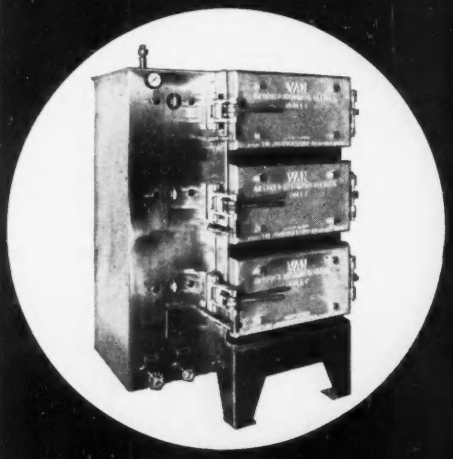
Government Publications. "Over Forty and Looking for a Job?" is a new flyer issued by the Women's Bureau, U.S. Department of Labor, as Leaflet 13. Discussed as pointers for the older job-seeker are: up-to-date job training; the eight-way system of looking for jobs; properly conducted interviews; and advisability of seeking jobs which have features younger women might dislike, i.e., "odd" hours, traveling, living on the premises, and so on. Social Security credits for older women are explained, and three more government publications are cited for further information. This leaflet may be obtained from the Government Printing Office, Washington 25, for 5 cents.

Interns Graduate. Caps and certificates were presented to twelve dietetic interns at the *VA Hospital, Hines, Illinois*, at graduation exercises on September 10. Dr. Einar S. Andreassen, Area Medical Director, VA Area Office, Fort Snelling, Minnesota, delivered the graduation address. The class of 1952 includes: Celia Louise Brain, May M. Imori, Betty Jane Krueger, Miriam Lough, Marion O. Marsh, Esther L. Martin, Martha L. Negley, Mary Jane Pellegrino, Nancy C. Petry, Ruth A. Prichard, Ethel R. Weaver, and Betty Jo Wyatt.

Eleven dietetic interns completed their courses at the *VA Hospital, Bronx, New York*, on September 14. They are: Theresa A. Calligaro, Barbara A. Cooney, Julia V. Farr, Irene Figner, Betty Sue Keffer, Grace B. Kehoe, Julia Ann Melvin, Madeline A. Miller, Florence L. Mitman, Betty C. Reed, and Hilda Werner

Ole Salthe. Ole Salthe, Executive Secretary of the Nutrition Foundation, Inc., died on September 10 in New York City. Mr. Salthe, a nutrition expert, first became well known when he was Director of the New York City Health Department of Food and Drugs. Later he was Secretary and General Manager of the New York Live Poultry Commission Merchants Association. Mr. Salthe served as a consultant to the Department of Agriculture in 1939. He had been Executive Secretary of the Nutrition Foundation since its establishment ten years ago.

Arnold Shircliffe. On September 20, The American Dietetic Association lost one of its staunchest supporters when Arnold Shircliffe died in Passavant Hospital, Chicago. Mr. Shircliffe was known nation-wide as a restaurateur *par excellence*. He was an authority on wines, menu making, and purchasing, and his collection of menus was the envy of many people in the field. During World War I, he served as a Major in the Army.



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initiating troop train food service in France. In World War II he served the Army and Navy in a consultant capacity. He had also had experience with dining car food service for railroads, and within recent years had been the Manager of the famed Wrigley Building Restaurant in Chicago. He had taught courses in universities offering restaurant and hotel management curricula, and was, in addition, a sought-after speaker and writer on the history of nutrition and food. At the time of his death he was working on a book of terms for the food service industry, which he hoped might help to standardize terminology. He had been an associate member of A.D.A. since 1928, and it is with regret that the *Journal* reports the passing of this cultured man and friend of the profession.

Margaret Elizabeth Burriss. Margaret Elizabeth Burriss, Head Dietitian of Stewards Hall, University of South Carolina, died September 4 following an automobile accident. Miss Burriss had also been dietitian at the Boarding High School, Tamassee, South Carolina, and Director of the YWCA Cafeteria in Greenville. She had been an A.D.A. member for twelve years.

CARE Holiday Food Packages. CARE, Inc., announces that three food packages have been especially prepared for holiday gift-giving to those in Europe. The annual CARE Holiday Package, containing a whole canned turkey plus the dinner "trimmings" for as many as twelve persons, is again available at $18.75 for delivery to ten countries. In addition, the canned turkey alone may be mailed for $12, and a $6.95 Budget Food Package may supplement the bird or be sent by itself. Further information may be obtained from CARE, 20 Broad Street, New York 5, or any local office of CARE. Deadline for Christmas orders is December 1.

Applesauce Suggestions. Home economists of the Department of Agriculture have recently made suggestions for saving time and fine flavor when preparing fresh applesauce in quantity.

They recommend the following method to save time in peeling: Wash, quarter, and core apples. Cook until soft in a small quantity of water in a covered pan. Put apples through a food press that removes skins easily and rapidly and gives a smooth sauce. If red apples are used, sauce made this way has an attractive pinkish tint from the peel. Add a few grains of salt and sweeten to taste while still hot.

The quantity of water to be used depends on two factors: the juiciness of the fruit and the desired thickness of the sauce. If too much water is added and the sauce needs to be "cooked down," the flavor may be altered. However, if the pan is closely covered, just a little water may be added and cooking need only continue until the apples are soft. Even so, the cook must watch the apples and adjust the heat to avoid scorching.

Another method of making applesauce is as follows: Pare quartered and cored apples, cook as above, and when apples are tender, crush pieces with a potato masher or stir until smooth. Add salt and sweeten to taste.

For variety in flavor, brown sugar or honey may be used for sweetening, or the apples may be cooked with raisins, a few whole cloves, or a stick of cinnamon which should be removed before serving. If apples are very mild, cooking with a small amount of lemon juice will add tartness.

Superconcentrated Grape Juice. U.S.D.A. chemists have now developed a "superconcentrated" grape juice which will aid in filling the armed services' need for full-flavored fruit juices in compact form. At the Eastern Regional Research Laboratory in Philadelphia, scientists have produced a grape juice concentrate which can be diluted with six parts of water to one part of juice, resulting in a concentrate of 75 per cent fuller strength than the same volume of frozen concentrates now on the market. A 4-oz. can of the "superconcentrated" juice yields more juice than the 6-oz. can now sold which is diluted in a three-to-one ratio.

The new concentrate may be frozen or kept satisfactorily in an ordinary refrigerator. In tests at the Laboratory, it was stored at 35°F. for as long as a year without spoiling. It can be used for flavoring ices, confectionery, carbonated beverages, and other foods.

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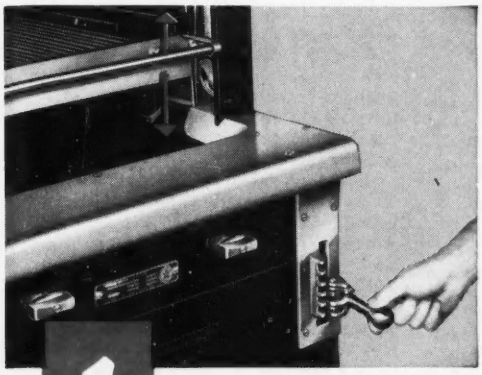
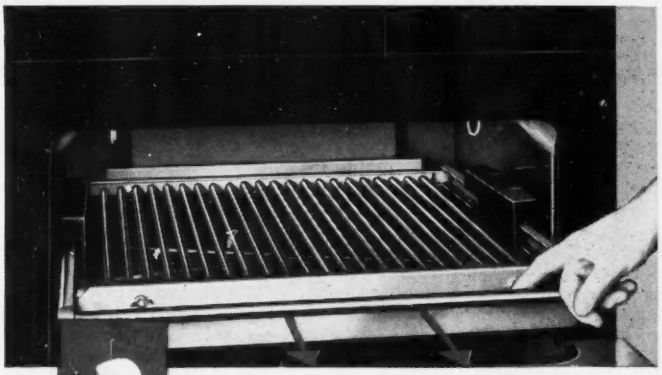


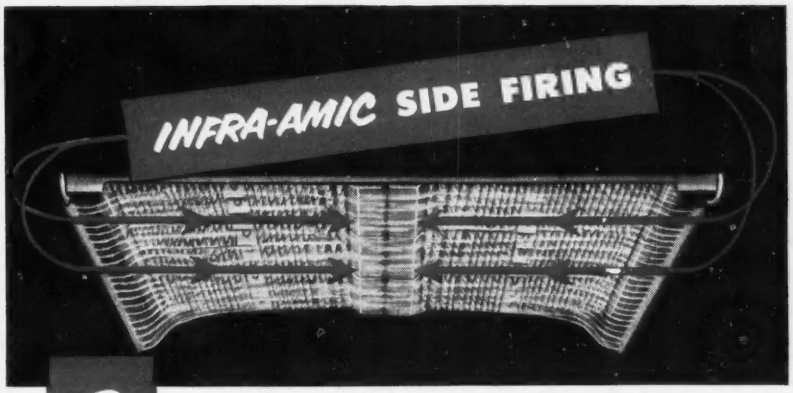
1

GRID LEVER is located out of heat zone; heavy spring counter balance raises or lowers grid at slightest pressure. Seven positions.



2

BROILING GRID is mounted on ball bearing carriage for finger-tip control; rolls in or out at a touch. "Floating" grid rods are specially designed to prevent warping under intense heat.



3

MULTI-JET BURNERS—one on each side—are separately controlled. Each one shoots flame across a specially designed ceramic area. The heat is radiated downward from the ceramics providing maximum intensity and uniformity of heat over a much greater area.

Dependability . . . speed . . . ease of operation! Yes, Garland offers you all this—and more! For Infra-Amic side firing not only gives you better broiling . . . it gives you more efficient broiling as well. And that, of course, means greater economy of operation. Leading Food Service Equipment Dealers everywhere recommend and sell Garland, the Leader! All Garland Units can be furnished in Stainless Steel and equipped for use with Manufactured, Natural or LP Gases.

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Details for making the "superconcentrate," including costs and required equipment, are described in "High-Density Full-Flavor Grape Juice Concentrate," published by the Bureau of Agricultural and Industrial Chemistry as AIC-342. Copies may be ordered either from the Bureau of Agricultural and Industrial Chemistry, Washington 25, or from the Eastern Regional Research Laboratory, Chestnut Hills Station, Philadelphia 18.

News of State Associations

California Dietetic Association. The September meeting of the *Bay Section* of the California Dietetic Association was held at Alameda Hospital, Alameda. Guest Speaker was Henry T. Maschal of Harris, Kerr, Forster, and Company, accountants, who spoke on "A Clinic of Accounting Problems." Mr. Maschall answered questions on food cost accounting which had been submitted to the program chairman. He emphasized that more control of food and meal costs should be exercised, and that a large portion of the actual accounting records can be made in the business office except in very small hospitals.

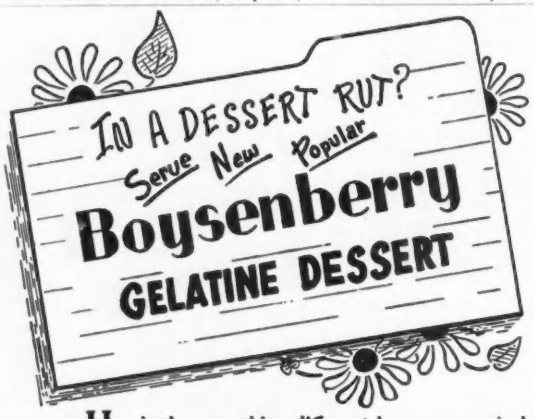
Kansas Dietetic Association. Officers for 1952–53 of the Kansas Dietetic Association are: President, Mary Alice Streator, Santa Fe Hospital, Topeka; President-Elect, Helen Ger Olson, Kansas State Board of Health, Topeka; and Secretary, Velma Knearl, VA Center, Wichita.

The *Kansas City Dietetic Association* will have the following officers for 1952–53: President, Evelyn Carter, Bethany Hospital; Vice-President, Esther Washington Williams, St. Margaret's Hospital; Secretary, Patricia Payer, University of Kansas Medical Center; and Treasurer, Monica Farrell Cameron, Kansas City, Missouri.

New officers of the *Manhattan Dietetic Association* are: President, Dr. Beulah D. Westerman, Kansas State College; Vice-President, Lois Turner; and Secretary-Treasurer, Dr. Leah Ascham.

Officers of the *Wichita Dietetic Association* for the coming year are as follows: President, Jean Dickenson; Vice-President, Dorothy Wolf, Wesley Hospital; and Secretary, Dryden Quist, University of Wichita Commons.

Rhode Island Dietetic Association. For the last two years, the Rhode Island Dietetic Association has been cooperating with the R.I. League of Nursing Education in a project of curriculum revision of a course in nutrition for student nurses. The goal of the project is to provide an adequate guide for schools of nursing in the state for teaching nutrition with special emphasis on the social and health aspects. A number of units have already been completed—on carbohydrate, protein, fat, minerals, vitamins, utilization, digestion, and food economics—and it is hoped that the final unit, bibliographies, and final polishing can be accomplished this fall.



You'll be delighted!

Here's the something different in an economical dessert so many dietitians have asked for! Perky, sparkling, Boysenberry—latest addition to the famous H.B.C. quality line—so delicious it has become one of our leading sellers! Other unusual flavors include such tempting specials as *Apricot, Ginger Ale, Pineapple, Wild Cherry and Spiced Peach*—a total of 16 to choose from.

Perfect for salads as well as desserts!

Each 1 lb. 10 oz. can makes one gallon—or 32-4 oz. servings at a cost of 1¾ to 2 cents per serving. Ask for our new "Unusual Gelatine Desserts and Salad Recipes" booklet—for quantity users.

Be sure to order some of these new and unusual flavors today.

12/10 lb. cans	lb. 36c	6 dozen 1 lb. 10 oz. cans	Doz. $7.35
Case of 6/10 lb. cans	lb. 37c	4 dozen 1 lb. 10 oz. cans	Doz. $7.55

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News of Advertisers and Exhibitors

Procter & Gamble recently opened a new research laboratory near Venice, Ohio, which will use radioactive tracers, an electron microscope, and tremendous pressures in the study of soaps, synthetic detergents, shortenings, and drug products. Named the Miami Valley Laboratories, the new unit will employ 300 people, including 110 graduate chemists and engineers. The two-story building includes facilities for biochemistry, physical chemistry, organic and analytical chemistry, as well as engineering and packing laboratories.

The Big Apple Book, featuring recipes for apples in baked goods, has been released by *Procter & Gamble's* Bakery Research Department. This eighteen-page booklet, punched for inclusion in loose-leaf material, presents recipes for: old fashioned apple pie, blush apple pie, caramel apple pie, butterscotch apple pie, French apple pie, Swiss apple pie, open apple pie, applesauce cake, apple kuchen, blush apple kuchen, apple brown betty tarts, and Graham cracker applesauce pie. Mats and electros of the illustrations are available for advertising purposes to restaurant operators from the P & G Bakery Service.

National Dairy Council has recently published a twenty-one-page, two-color booklet on nutrition for preschool children titled "Feeding Little Folks," by E. T. McEnery, M.D., and Margaret Jane Suydam. The booklet is divided into three sections: (a) what to expect in children (behavior, related and unrelated to food); (b) what foods children should have; and (c) how to bring children and foods together *happily*. The essential foods are discussed individually, and ways to make them appetizing are suggested.

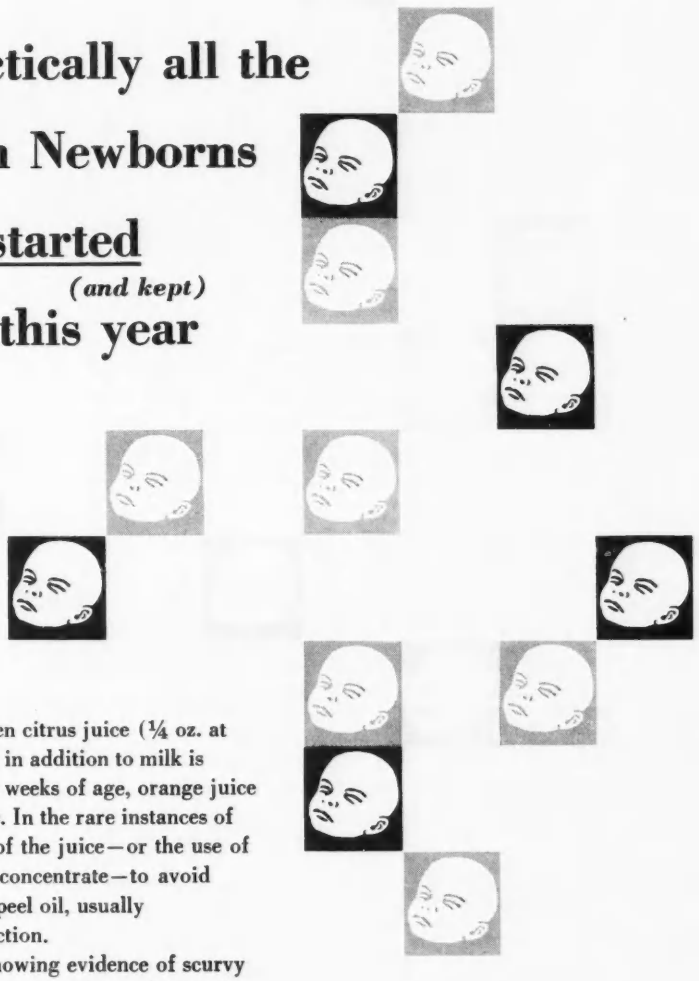
"Do Your Children Have a Healthful Day?" is a four-page leaflet also distributed by *National Dairy Council*. The two inside pages bear a question "Your Child's Day: This or This?" and show by illustrations recommended routines compared to bad ones.

General Foods Corporation is now introducing nationally its new Jell-O Coconut Cream Pie Filling and Pudding for institutional use. The product is offered in 4-lb. canisters, each of which contains the "makings" for fifteen 9-in. pies. Designed mainly as a basic pie filling, to which only milk need be added, it may also be used to make puddings and novelty-type pies. Recipes for coconut meringue pudding, nesselrode pie, and banana pie are printed on the label. Three other Jell-O Puddings and Pie Fillings—chocolate, vanilla, and butterscotch—are now being offered in new 24-oz., wax-wrapped packages as well as the larger sizes.

Another new *General Foods* product is frozen Birds Eye Chicken Pie, first introduced to the retail market in the East in October.

Eugenia Hoffert is the new "Anne Marshall," Director of *Campbell Soup*

Practically all the 3.5 Million Newborns can be started *(and kept)* on Citrus this year



Newborns can safely be given citrus juice (¼ oz. at first) as soon as any food in addition to milk is permitted. Even at three weeks of age, orange juice is virtually non-allergenic. In the rare instances of sensitivity, gentle reaming of the juice—or the use of specially prepared frozen concentrate—to avoid contamination with peel oil, usually obviates any reaction.

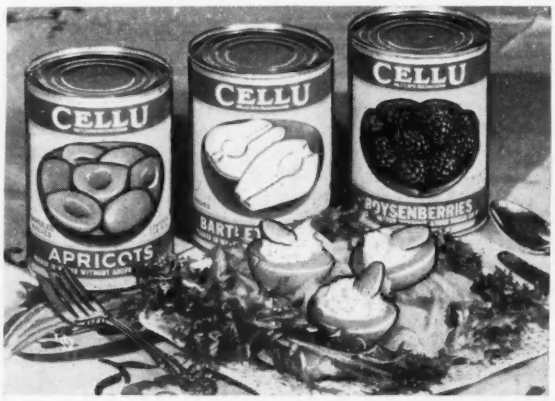
With postmortem studies showing evidence of scurvy ten times as frequently as it was observed clinically, more than ever it is apparent that children must be guarded vitamin C-wise to insure adequate growth and development.

FLORIDA CITRUS COMMISSION • LAKELAND, FLORIDA

FLORIDA *Citrus*

ORANGES • GRAPEFRUIT • TANGERINES

For
LOW
CALORIE
and
Carbohydrate
Restricted
DIETS



CELLU WATER PACK FRUITS

Large, firm, sun-ripened fruits packed in water without added sugar or other sweetening. This gives a pleasant tasting fruit, lower in carbohydrate and caloric value than fresh or ordinary canned fruits. Particularly useful in reducing diets or other diets of reduced carbohydrate value. Food values are printed on all labels. Choice of all popular fruits Also available are Cellu Juice-Pak Fruits, packed in natural, unsweetened juice.

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BIGGER Variety!
FINER Flavor!
GREATER Economy!

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

Blue Boy
DIETETIC VEGETABLES
NO SALT OR SUGAR ADDED

ANALYSIS of FOOD VALUES PRINTED ON EACH LABEL

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- Cream Style Corn
- Corn on the Cob
- Peas—Spinach
- Peas and Carrots
- Diced Carrots
- Cut Green Beans
- Cut Wax Beans—Lima Beans
- Diced Beets—Sliced Beets
- Whole Beets—Tomato Juice
- Apple Sauce—Tomatoes

IN 8 oz. & No. 2 CANS AT YOUR GROCERS

Write Haxton Foods, Inc., Oakfield, N. Y. for brochure with analysis and product data.

EATING IS FUN—
for
Older People, Too

Designed to Aid Proprietors of Small Nursing Homes and Residences.* Also *Adaptable to Home Kitchens

This attractive booklet is a guide to better food and food service in the small institution.

Based on normal nutritional requirements for adults, the menu patterns, sample suppers, and pointers on meal planning have their place in any household. Practical ideas for making the work of the manager easier and pleasanter include a weekly marketing guide, hints for economy in buying and storage, and suggestions for serving.

This is a project of the Diet Therapy Section of The American Dietetic Association.

Single copy 50¢

Five copies $2.00
Ten copies 3.75

Order from:
THE AMERICAN DIETETIC ASSOCIATION
620 North Michigan Avenue
Chicago 11, Illinois

Company's Home Economics Kitchen, replacing Alice W. Brown. Miss Hoffert, formerly in charge of the Division of Home Economics, American Meat Institute Foundation, Chicago, is a graduate of Iowa State College. She has worked as a woman's counselor, nutritionist, and teacher, and was also on the staff of Procter & Gamble.

A new *Campbell Soup* publication will be of interest to nutritionists and dietitians studying food habits. Titled *How, When, What . . . America Eats*, this twenty-page booklet presents in graph form the results of a national survey of eating habits. Included are such interesting points as: name of noon meal, husbands home for noon meals, foods served at noon meal, favorite evening meals, and where school children eat lunch. Some of the breakdowns are weighted to show how soup is used; others to show socioeconomic, geographic, and population factors involved. It is interesting to note that the largest percentage of people serving jellied soup come from the above-average socioeconomic group living in New England and the Middle Atlantic states in cities of 500,000 and over.

Armour & Company has issued a colorful, six-page illustrated folder, "How Much Did This Meal Cost Me?" Designed to help quantity food producers, it stresses important factors such as accurate portion control, labor costs, and waste in the serving of meat which affect cost. On the back page, a table gives portion size or average weight, method of packing, description of the product, and suggestions for serving for twenty-two frosted meat cuts as well as hamburger. The columns for price per pound and portion cost are left blank so that the food service manager may fill in current prices in the locality. Institutional-size packages of Armour's Fresh Frosted Meats are also illustrated.

International Molded Plastics, Inc. has developed Crystalon Tumblers, a shatterproof, chip-proof clear plastic product available in a fluted design which minimizes scratching. The tumblers conform to sanitation codes, withstand a heat of 180°F., and may be washed in automatic dishwashing machines. Currently available in 10-oz. drinking tumbler size, Crystalon Tumblers will also be made in 5-oz. fruit juice and 12-oz. iced tea sizes.

The Food Service Center of *H. J. Heinz Company* has recently issued a thirty-two-page booklet titled *Heinz Month at School*, containing menus and recipies for an entire school month. The booklet includes both "A" and "B" type menus and recipes, designed to meet federal school lunch requirements. All of the Type "A" luncheons can be prepared for 25 cents or less. Heinz condensed soups appear in many of the recipes as meat extenders. Recipes are given for one dish in each menu, and the protein, carbohydrate, and fat content of each recipe per serving are listed. The booklet, issued for free distribution to schools, is being made available through Heinz sales branches and the Heinz Food Service Center in Pittsburgh.